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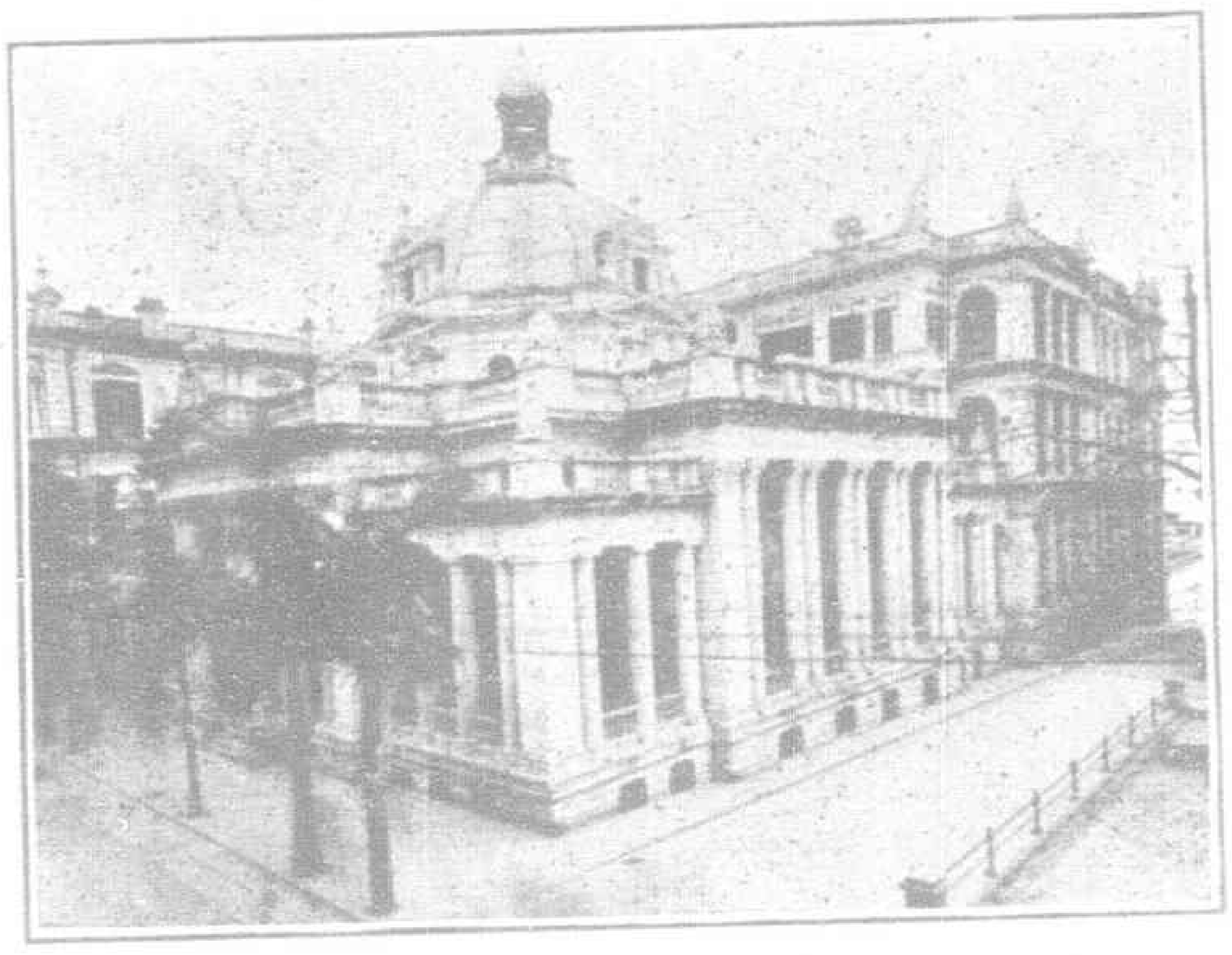

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(See page 219)

JAMES GILBERT WHITE

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THE PHILIPPINE SITUATION

According to meagre telegraphic advices from Washington, President Roosevelt in his message to Congress strongly urged the passage of the Philippine Tariff Bill, which was strangled in the Senate Committee on the Philippines during the last session through the instrumentality of the sugar and tobacco interests of the homeland. President Roosevelt is quoted as having said that this legislation is a sacred duty long ago recognized by the masses of the people of the United States, and thus acknowledged by the passage of the bill with an overwhelming vote in the House of Representatives, and he insisted that the country could not shrink from its obligation towards these possessions in view of the peculiar conditions existing between the homeland and the Islands. According to one Manila paper Mr. Roosevelt laid stress on the hardship that is worked on the Islands by the present unfriendly attitude towards our products by the United States, at the same time devoting much space in his message to a justification of the course pursued by the Government in dealing with the political status of the Islands. In short, the President justifies without equivocation our policy in the Philippines.

While we can not pretend to possessing any very large degree of confidence in the outlook for the passage of the tariff bill, with the modifications covering sugar and tobacco, we are willing to be optimistic enough to hope for the best. Our friends in Washington—the President, Secretary Taft and the Bureau of Insular Affairs—can always be counted on to work for our interests. This is something to boast of, to be sure, but we only wish that we could feel as certain about the fair-mindedness of the honorable gentlemen of the astute Senate. It is right in this body where our best friends should be, but unfortunately our President and our Secretary of War can not be there other than through their influence. However, let us hope that this influence, which is altogether on the side of right and justice, will avail.

While we must ever regard congressional fealty to the Islands the most substantial and practical prop to our work for the rejuvenation and promotion of our industries and commerce, we can not expect Congress to take the interest in the Islands we demand without showing a disposition right here at home to bear our share of the burden. Our special tariff committee has warmed up to its work and is doing all it can to interest capitalists and manufacturers in our fight at Washington, our Governor-General is proving by hard work that he is thoroughly alive to the situation, and our merchants and manufacturers, regardless of nationality, indicate a unity of purpose that is most encouraging. All along the line there is unselfish unison of action for the bettering of local conditions that demands general appreciation. But what does all this amount to if the people themselves do not lay aside petty bickerings and prejudices and show by their works that they, too, are in earnest? Just at the present time we are having altogether too much politics for our own good. Governor-General Smith realizes this and during his recent important and impressive tour of the Southern Islands he never lost an opportunity in public or private speech to impress upon the minds of the people the necessity of their laying aside political strife and getting down to hard work. In their own conduct largely depends the future welfare of the Islands. No matter if Congress gives us everything we ask for, and adds to this benevolence ten other bills of as great importance as the tariff measure, unless the people themselves get down to work and till the soil we are about as bad off as ever.

We have read with great interest the published observations of the President of the Philippine Products Company, Mr. Franklin G. Colby, along these lines, and they are impressive, to say the least. He says very truly that politics will not help these people, nor can the Government make them happy. Without industrial activity and agricultural development all of our big harbor improvements, etc., will amount to nothing. If the people will not vie with the Government in establishing and maintaining good provincial roads, if they will not abandon petty politics as a means of livelihood without the necessity of manual labor, if they will not cease to antagonize every attempt of the Government to give them good and useful legislation for the provinces, if they will not give at least one part of their citizenship to the public weal, if they must keep the other nine parts for their own selfish ends, surely the community must continue in the same bad way as before. With the average Filipino his greatest sin against his country is absolute indifference towards the welfare of his neighbor and his land. The almost universal inclination seems to be a livelihood without labor. Politics is the most alluring field for indolence, and at the same time it is probably the greatest of the Filipino's sins because it strikes directly at the heart of the country and harrasses the Government. What we must have here is universal peace, sincere and constant coöperation on the part of the natives and the absolute elimination of politics from our path. We must all get together and help the Government in its single-handed efforts to bring about harmony in the land and a realization of our individual responsibilities towards our neighbors. It is the duty of the native press to teach their provincial clients the dignity and value of labor, the necessity for agricultural activity and the importance of railway and road construction to their own prosperity. Commenting on Mr. Colby's remarks editorially, *The Manila Times* has this to say, which fits in nicely with the situation:—

> To our Filipino politicians Mr. Colby would say: —"Get away from theories and visions, shut up the fountains of brilliant but unnecessary oratory, leave vain debate and perennial, unsatisfying discussion, substitute works for words, get out among your people and sing them the song of the plow, teach them the dignity of labor, instruct them how to make two blades of grass grow where now there is only one, get them out of their shiftless way of 'doing things rather more-or-less', let the hum of the loom, the whirr of the buzz-saw, the purr of the dynamo, the clip of the axe, the clang of the hammer, *the divine chant of the crank* and the piston-rod re-echo through the land bringing the gladness of abundance and the comfort of prosperity. Leave political independence to look out for itself content in the knowledge that it must follow economical independence as the night follows day. Grasp the substance of things and let go the shadow!"

MINERAL RESOURCES OF INDIA

According to Mr. William H. Michael, American Consul-General at Calcutta, the *rush for the mines of India* has not yet set in, but he thinks it is safe to predict that it is not very far off. Europe and America have their scientists in the field in limited numbers prying into things, and the results due to *rich finds* are certain to follow.

Last year's returns show some encouraging activity. For Baluchistan there were issued four leases for coal and chromite. For Bengal one prospecting license was issued for iron in Mourbhanj, and for any minerals, metals, precious stones, especially copper ore, in Darjeeling. For Bombay Province there were issued four exploring licenses for gold, manganese, and other minerals, 12 prospecting licenses issued for manganese, manganese ore, aluminum, bauxite, red ocher, copper, cinnabar, quicksilver, and gold, and one mining lease for coal and manganese.

The licenses in Bombay were taken out by a scientific agent representing one of the largest and most enterprising prospecting and mining companies in the United States, upon whose report will depend whether his company's capital be largely invested in mining operations in India or not. For Burma there were issued 16 exploring licenses for tourmaline, coal, petroleum, gold, iron, tin, silver, copper, lead, zinc, rubies, precious stones, and other minerals, and two mining leases for gold, precious stones, and marble.

For the central provinces there were issued 17 exploring licenses, 31 prospecting licenses, and five mining leases for manganese, iron, stone, and coal. For eastern Bengal and Assam there was issued one prospecting license for coal and oil in the Khasi and Jaintia hills. For Madras Province there were issued six exploring licenses, 31 prospecting licenses, and 17 mining leases. For the Punjab there were issued 10 prospecting licenses.

It will be perceived by reference to the map of India that these licenses and leases authorize operations practically all over India. Indeed, it would seem that wherever hill and mountain elevations exist there may be found minerals of more or less value. As the Indian railroad system is extended, bringing these hitherto inaccessible places for profitable mining within easy reach, enterprise and capital are finding out and utilizing the rich and extensive resources of India.

Without doubt Americans will contribute their share toward this development by actual mining and by supplying the best and most thoroughly up-to-date mining machinery and equipment thus far invented.

In this connection the export of metals from India might not inappropriately be given. Manganese ore represents nearly 82 per cent of the value of all exported metals and manufactures thereof other than hardware, the residue consisting of manufactures of brass, copper, and iron. The exports for 1904–5 amounted to 180,945 tons, which is not a bad showing in view of the fact that the trade has grown up within 10 years. The falling off of Russian imports, due to the disturbances in that country, gave a decided impulse to the trade, and now that India has realized what she can do in this line it is not unlikely that her metal exports will increase right along. Prior to the internecine troubles of Russia, which almost completely prostrated the work of the mines of Donets, as also those of the Caucasus, she exported 420,000 tons, all of which trade was lost.

This was India's opportunity and her metal exports shot up to 316,694 tons, an actual increase of 75 per cent, while the value rose 79 per cent, amounting to $4,300,000 gold. This also shows a small rise in the average value per ton of a trifle less than 11 cents, or 2¼ per cent, yet it would seem that the real gain must have been larger than that, as the price of manganese in Europe advanced in the same period by 50 per cent.

The metal exports from India go for the most part to America, the United Kingdom, and the Continent of Europe in quantity in the order named. This is one valuable and growing export of India that the United Kingdom has not cornered. The field is an open one, with America in the lead as a *taker*, and there is really nothing in the way of the employment of American energy and capital in producing here in large quantities the basic metals needed in American manufactures for the supply of the world.

During 1905 the Indian mines raised some 7,762,779 tons of coal, the largest quantity on record, but, large as it seems, it is very far below other countries, and places India ninth on the list. The total output of the principal coal-producing countries of the world, including India, is roughly 853,000,000 tons, so it is at once apparent what a poor show India makes with not 1 per cent of the total output, and what possibilities there should be in the future. Yet there is a steady increase, which is shown by the fact that the tonnage in 1899 amounted to but 4,622,242, in the raising of which were employed 65,795 persons, while for 1905 the tonnage was 7,762,779, with 80,496 people employed.

Manganese, mica, and limestone are three minerals the output of which is increasing. In 1899, 87,126 tons of manganese ore were produced; in 1903, 171,223 tons; and in 1905, 204,194 tons. Of mica, 10,860 hundredweights were produced in 1899 and 25,548 hundredweights in 1905. Of limestone, 1,177 tons were produced in 1899 and 93,176 tons in 1905.

BELGIUM'S COMMERCIAL INVASION OF JAPAN

Belgian manufacturers are demonstrating that they are alive to the present abnormal development of the Japanese by strenuously pushing their products in that direction, and their efforts have been attended with a measure of success sufficiently encouraging to establish in the Oriental Empire a Belgian-Japanese Bureau for the reciprocal extension of trade. As a result of these closer commercial relations it is promised that much Belgian capital will be invested in Japanese enterprises in the near future, a glass-making company having already been organized.

According to recently published statistics the Belgian exportations to Japan in 1905 amounted to over $5,000,000 gold, or about double that of the previous year. The Japanese exportations to Belgium in 1905 were $330,000 gold, against $150,000 for 1904. The principal Japanese products sent to Belgium were straw plaits, amounting to $17,000 gold; fish, oil, herring and sardines, $95,000, and rice amounting to $22,500.

The principal Belgium products sold to Japan in 1905 were iron bars and beams to the amount of $2,153,493 gold, against $960,000 in 1904; glass in 1905 amounted to $575,000, against $340,000 in 1904; iron plates in 1905, $670,000, against $320,000 in 1904; and paper for printing, etc., $965,000 in 1905, against $133,000 in 1904. It will be seen that Belgium is making giant strides with her metallurgic and glass products in advance of her other manufactured materials. Belgian manufacturers follow orders closely and grant all consistent concessions to the Japanese trade. By so doing they are "making good" among these enterprising people.

JAPAN'S GREATEST BATTLESHIP

Close upon the completion and concluding trials of the great British battleship *Dreadnought*, the latter of which showing that both as to steam and gunnery she is a triumphant success, comes word from the north that the new Japanese battleship *Satsuma* has been launched, which carries with it the indisputable prestige of Japan's having the heaviest battleship afloat. For the *Satsuma* stands to the *Dreadnought* at 19,200 tons to 18,000 tons. The *Satsuma* will of course not be completed till next year, for she has yet to take in all her heavy weights, including armor plates and armament. As to the armament the *Dreadnought* has 10 12-inch guns, eight of which can be fired simultaneously on either broadside. She also carries a number of light quick-firing guns as *destroyer-killers*. At any rate these light quick-firers are to deal with hostile destroyers before they come within torpedo radius, now about 4,000 yards, of the battleship. The *Satsuma* like her sister ship *Aki*, which will be completed in 1908, is to carry the usual battleship arrangement of four 12-inch guns in fore and aft barbettes; but these are supplemented by no fewer than 12 10-inch guns, which must be considered as primary rather than as secondary armament. She is also to carry as quick-fire armament 12 4.7 guns. Japan as a naval nation has now fully graduated, for no longer, as before the late war, does she depend on British or other dockyards for the supply of her largest type of battleship. Japan now builds these at home, at Yokosuka or Kure, and her latest effort takes precedence of any ship in any fleet in the world for actual tonnage. This means a great industrial migration, and Japan's newly-attained independence of western dockyards bestows upon her a power of naval initiative that can be easily appreciated. Nowhere between Suez and San Francisco can there be accomplished so great an achievement in the way of naval construction as that implied in the building of the battleship *Satsuma*.

REINFORCED CONCRETE IN THE ORIENT

Indications point to reinforced concrete as the coming material for structural engineering throughout the Far East. The Government of the Philippine Islands has decided that it shall be used in public works and buildings of whatever description, timber construction to be almost entirely eliminated. A number of privately-owned buildings of reinforced concrete have been erected to the entire satisfaction of contractors and owners, and in the immense work of building railroads in the Philippines, only recently inaugurated, concrete will be generally used.

While modern engineering practice and building methods are an innovation in the Philippine Islands which dates back only to American occupation, it is a fact to be proud of that in the matter of public works and other such enterprises our engineers are setting a pace for the other communities of the Orient to follow. Among the engineering profession of the Orient there are indications of an absorbing interest in the practice adopted here, with a view to the application of the best methods to engineering work elsewhere. From the northermost parts of China and throughout the empire, in Japan, the Straits Settlements, the Federated Malay States, India and Australasia—in fact, wherever THE FAR EASTERN REVIEW has "exchange" relations in this great oriental field—there seems to be a spontaneous inclination in engineering circles towards reinforced concrete in building construction, while the use of concrete in pier, wharf, bridge and culvert construction seems to be universally acceptable. To be sure, it will be a long time before this material entirely supplants the older materials—if it ever does do this—but the signs point to its adaptation by the majority of the more progressive engineers.

Practical experience in the Philippines shows conclusively to engineers that while the first cost of reinforced concrete construction may be a trifle higher than that where other materials are used, the after-results will make it by far the cheaper material. Far-sighted authorities such as the Atlantic, Gulf and Pacific Company, J. G. White & Co., Mr. J. W. Beardsley, head of the insular engineering bureau; Mr. F. A. Molitor, Supervising Railway Expert of the Philippine Government; Mr. E. J. Beard, chief engineer of the construction of the new railroads in the Visayan Group of the Islands, and Mr. Horace L. Higgins, chief engineer of the Speyer Syndicate that is constructing the new railways on the Island of Luzon, as well as all others who have indirect or direct control of large construction projects, all agree that concrete is the coming building material. It is also believed that by the careful and economic use of concrete, and other marginal supervision by competent overseers, the first cost of such construction can be brought down to figures as low as those that have heretofore ruled under the old-established practice.

Another important feature to be considered in the adoption of concrete for general construction is the livening effect it is having on the cement industry in the Far East. The "Green Island" factories at Hongkong are being constantly enlarged to meet the ever-growing demand for their excellent product, and further north the "Tongshan" plant of the Chinese Engineering and Mining Company is doing an immense business in cement. The Japanese have revived this profitable line of industry, with the result that within the next year Japan will be supplying a greater part of its local market. A cement factory is projected for the Philippines and other such industries are reported as being under consideration throughout Malaya. In Australasia the cement industry is now thriving, and yet the demand down there is greater than the supply. Besides, foreign cements that can compete with the oriental product find large demand, and so the whole market marches along overburdened with orders and teeming with activity to meet the requirements of the great field.

In view of the present activity in this line of engineering, THE REVIEW expects, in its next issue, to publish a very able contribution on reinforced concrete construction in the Philippines, which will also deal with climatic, economic and other features, thus giving to the article an importance that must command the interest of all engineers in like tropical countries. The article will be well illustrated and will be based upon actual experience and observation along this line of engineering.

ENGINEERING PROGRESS IN THE RECONSTRUCTION OF MANILA

Probably the most interesting feature of the annual report of the Municipal Board of the City of Manila, covering the period ended June 30th, 1906, and just published, is the details of the operations of the Department of Engineering and Public Works and the Department of Sewer and Waterworks Construction. Both of these branches of the Government have made remarkable progress in the general improvement program for which they are responsible.

DEPARTMENT OF ENGINEERING AND PUBLIC WORKS.—The cement-testing laboratory was operated with satisfaction during the year, and several shipments of cement intended for use on public works were rejected for failure to comply with the specifications. The equipment of the laboratory is rather restricted, and complete physical tests may not be made; however, in general, the tests have indicated with reasonable accuracy the character and physical qualities of the cement submitted. Although more complete tests are desirable to thoroughly determine the quality of cements for special purposes these may at present be omitted, but eventually the laboratory should be fully equipped in order that complete knowledge of all cements supplied in the local market may be obtained.

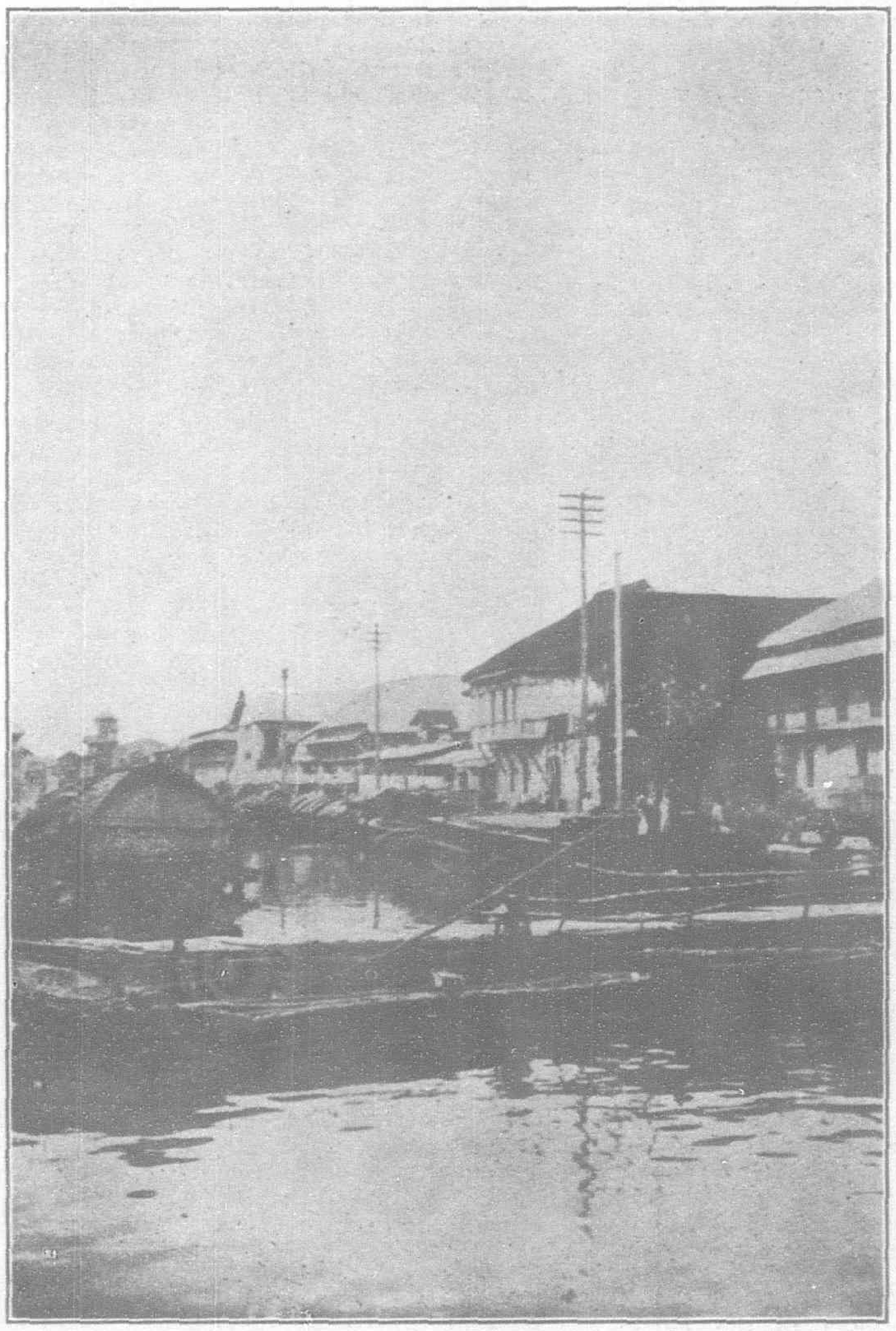
PASIG RIVER WALLS.—The river wall constructed under contract with Salvador Farré, west from a point near the old Santo Domingo Gate for a distance of approximately 304 meters, was completed for a total cost of ₱314,935.80. The original estimate of cost was ₱306,856, the increase in cost being due to minor changes found necessary in the work and to the increase in length and number of piles in certain doubtful portions of the work. The backfilling behind the wall was carried on with an expenditure of ₱10,014.22. It is recommended that the work be protected on the stream face by riprap, as dredging in the river to the depth of 18′, as determined by the Bureau of Port Works, may eventually create dangerous currents at the foot of the wall. A slight movement has already been observed in a portion of the work and may be traced to this cause.

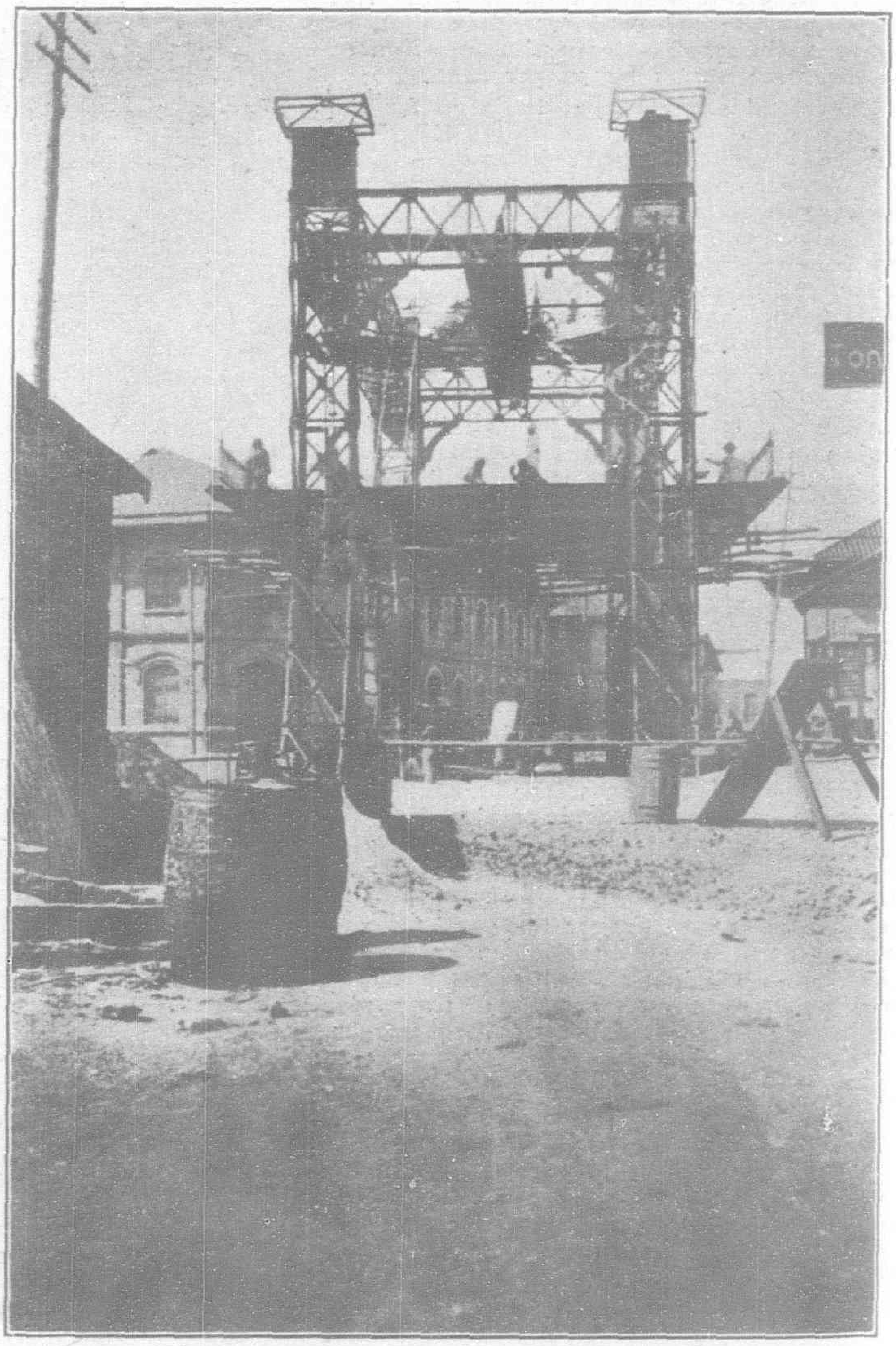
The Atlantic, Gulf and Pacific Company constructed the river walls immediately west of the Bridge of Spain. On the north side of the river a wall of approximately 95 meters' length was completed by the caisson method from the north abutment of the Bridge of Spain to the west side of Calle Rosario, at a cost of ₱111,255.86. In connection with this work, the west approach of the bridge was widened and a Guadalupe stone wall constructed in the rear of the Extremeña building. The grade of the approach was decreased from about 9 to 4.5 per cent, and its length increased from 30 to 55 meters. The substratum of soil near the bridge showed less bearing power than anticipated, and extra long piles were necessary to insure safety. Because of the shallow foundations of the north abutment of the bridge, a change in plan at this point was necessary, and special construction employed immediately adjoining the abutment. Signs of weakness appeared in the masonry of the abutment, and in order to avoid any accident heavy piles were driven as close to the bridge abutments as possible and concrete deposited in large bulk immediately alongside the abutment. As a further protection to the wall, a close connection between the abutment and the wall was avoided, and for a short distance immediately alongside of the bridge the wall was constructed as a screen without a caisson. This method of treatment has been very successful, and careful observation has failed to discover any weakness either in the wall or in the abutment. As a future protection to the work, especially heavy riprap was deposited at this point.

The work on the south wall was commenced at the east end of the Farré wall and carried on continuously from this point. The total estimated value of this work on June 30th was ₱130,508.16.

WATER SUPPLY AND SEWERS.—The equipment of the pumping station at Santolan shows signs of wear, but all the buildings there and El Deposito are in good condition. The rockfill dam on the Mariquina River was repaired in part and the concrete paving on the crest at the east end completed. The dam is reasonably tight and supplies sufficient water for the pumps.

The conduits and reservoirs are badly in need of overhauling, while the distribution system is in good condition in all its parts. The uncovered 26 and 22″ mains from a point east of Calle Tanduay to Calle Arlegui were lowered and covered, and the bridge crossing the line at Calle Tanduay removed. This job was of a rather difficult nature, in view of the fact that a stiff connection with the 3-flanged valves was located in the


SITE OF BINONDO LIFT BRIDGE BEFORE CONSTRUCTION (OLD FERRY)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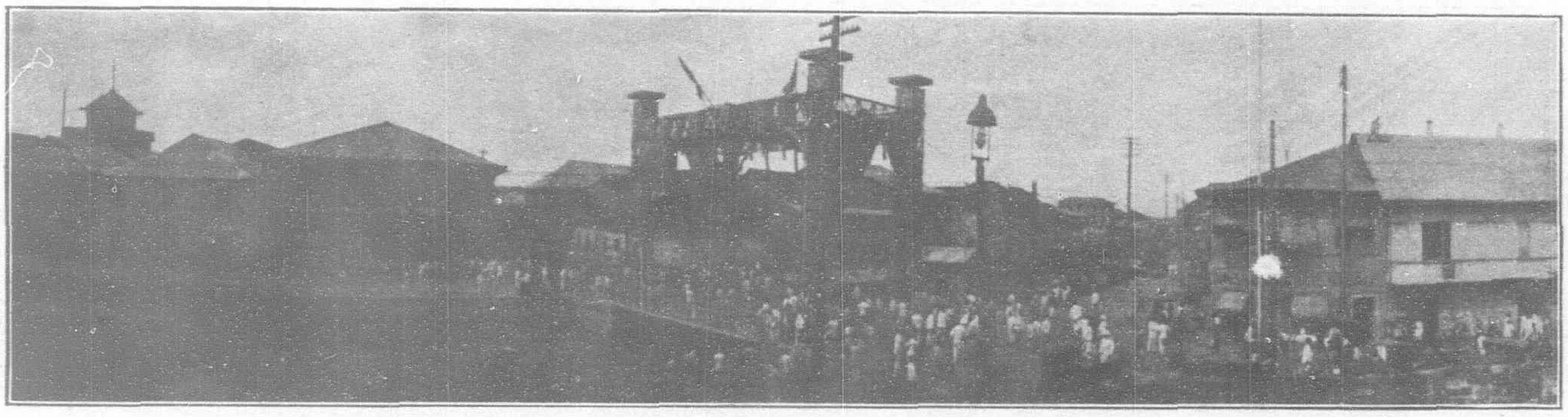


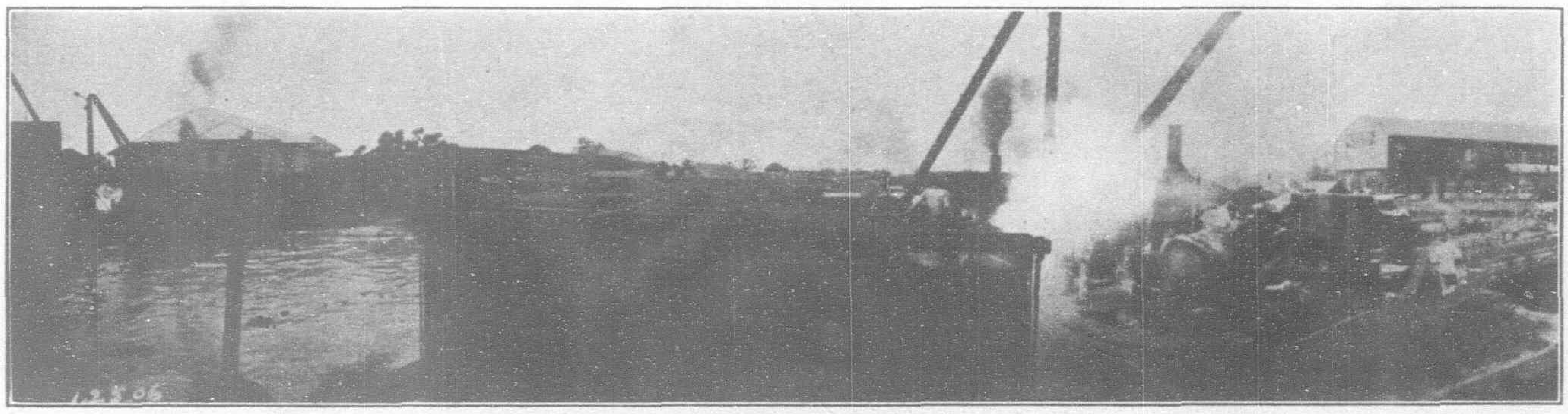
OFFICIAL OPENING OF BINONDO LIFT BRIDGE

bed of Calle Tanduay, and was necessarily moved as one piece. The total lowering at this point was about 1.50 meters and was accomplished without mishap or interruption of the supply. The total cost of the work was ₱2,069.29.

During the year 11 pipe extensions were laid, while the necessity for further extending the distribution system by lines of smaller diameter into the outlying districts is very apparent.

The fire-hydrant service was increased by 18 hydrants of a new pattern, and has been constantly in good working order. The Fire Department has been of great assistance in locating imperfections in the system by its monthly inspections and tests.

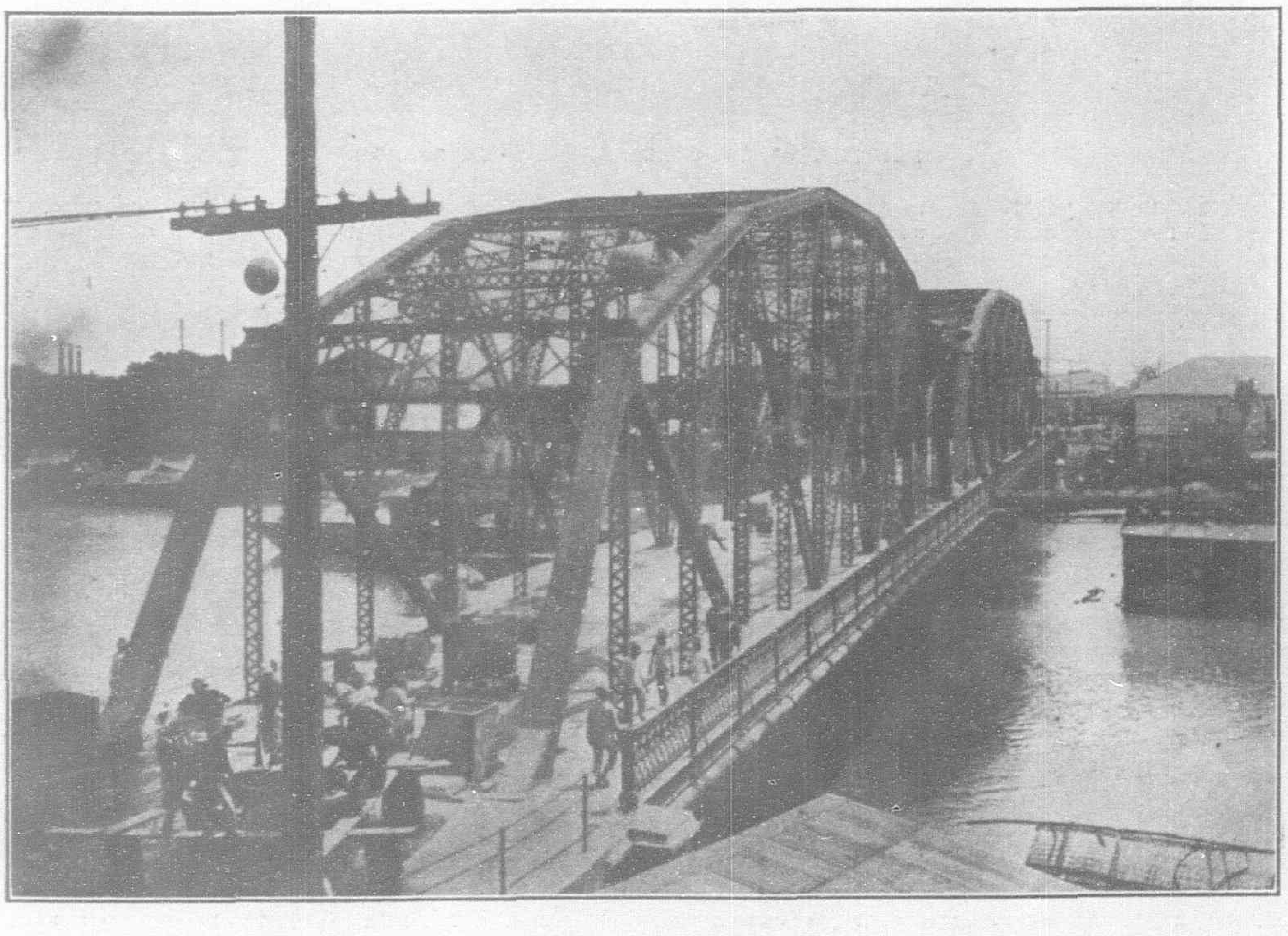
The installation of services has a substantial increase during the year. In all, 395 services were connected—an increase of 11 per cent in the total number of services. This increase may be traced in part to the extensive building operations and to the requirements of the Bureau of Health.



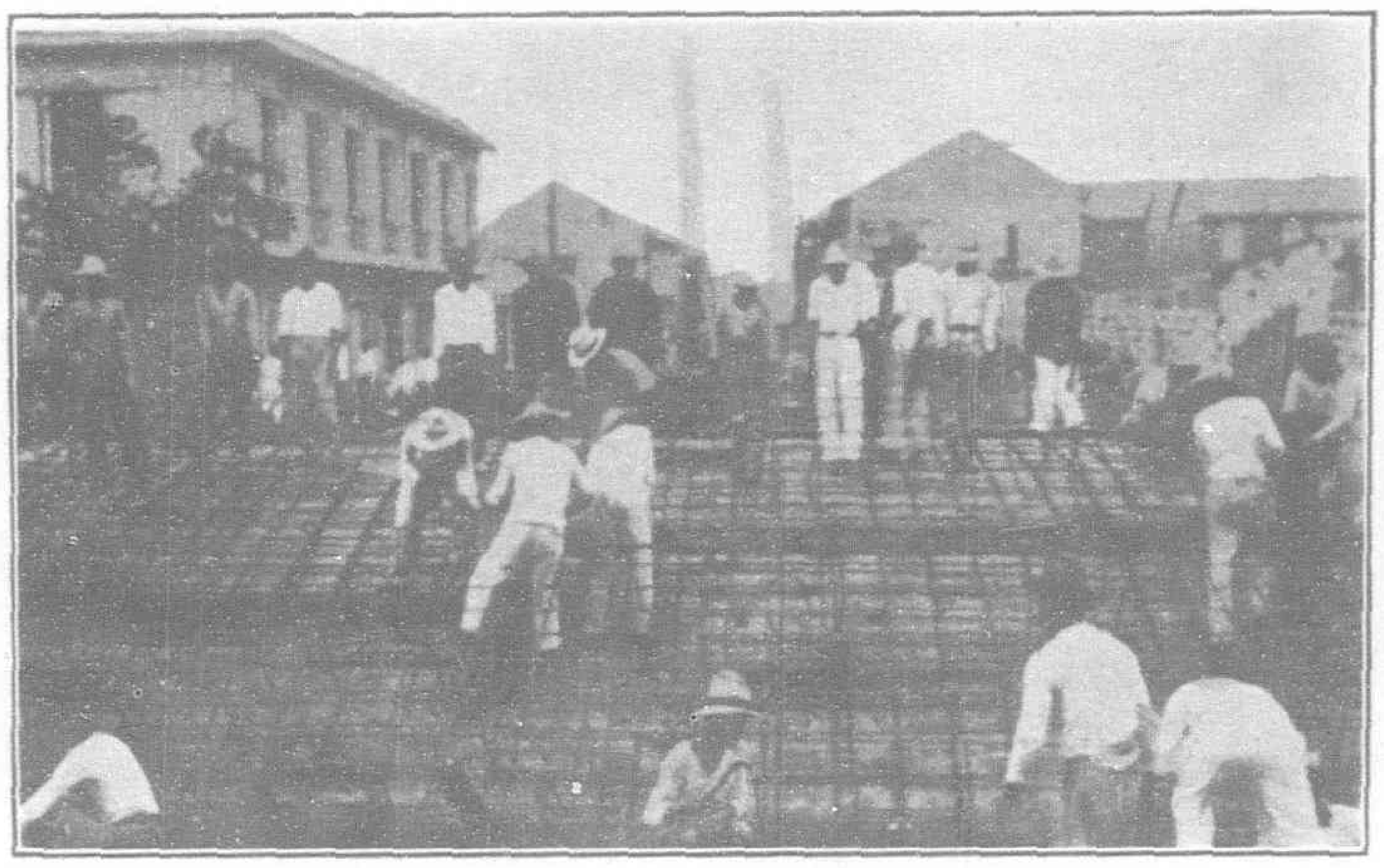
CONSTRUCTION CENTER PIER OF NEW AYALA BRIDGE

EXISTING SEWERS.—A general survey was made of the existing sewers in the city in order to determine their location, size and depth with reference to the city lines and benches. A large number of unknown sewers was discovered, and the data secured will be of extreme value in the sewer and water-works construction now under way. This survey has revealed the fact that a large amount of unnecessary work has been performed which eventually must be abandoned. The sewers constructed in the last two years on a definite plan have shown themselves to be capable of removing the water from the streets, even in the heaviest showers, and of keeping themselves clear of sediment. There are certain localities, however, which are badly in need of drainage facilities, particularly parts of the districts of Tondo, Paco and Ermita, where changes in grade and the construction of new streets have interfered with the natural drainage.

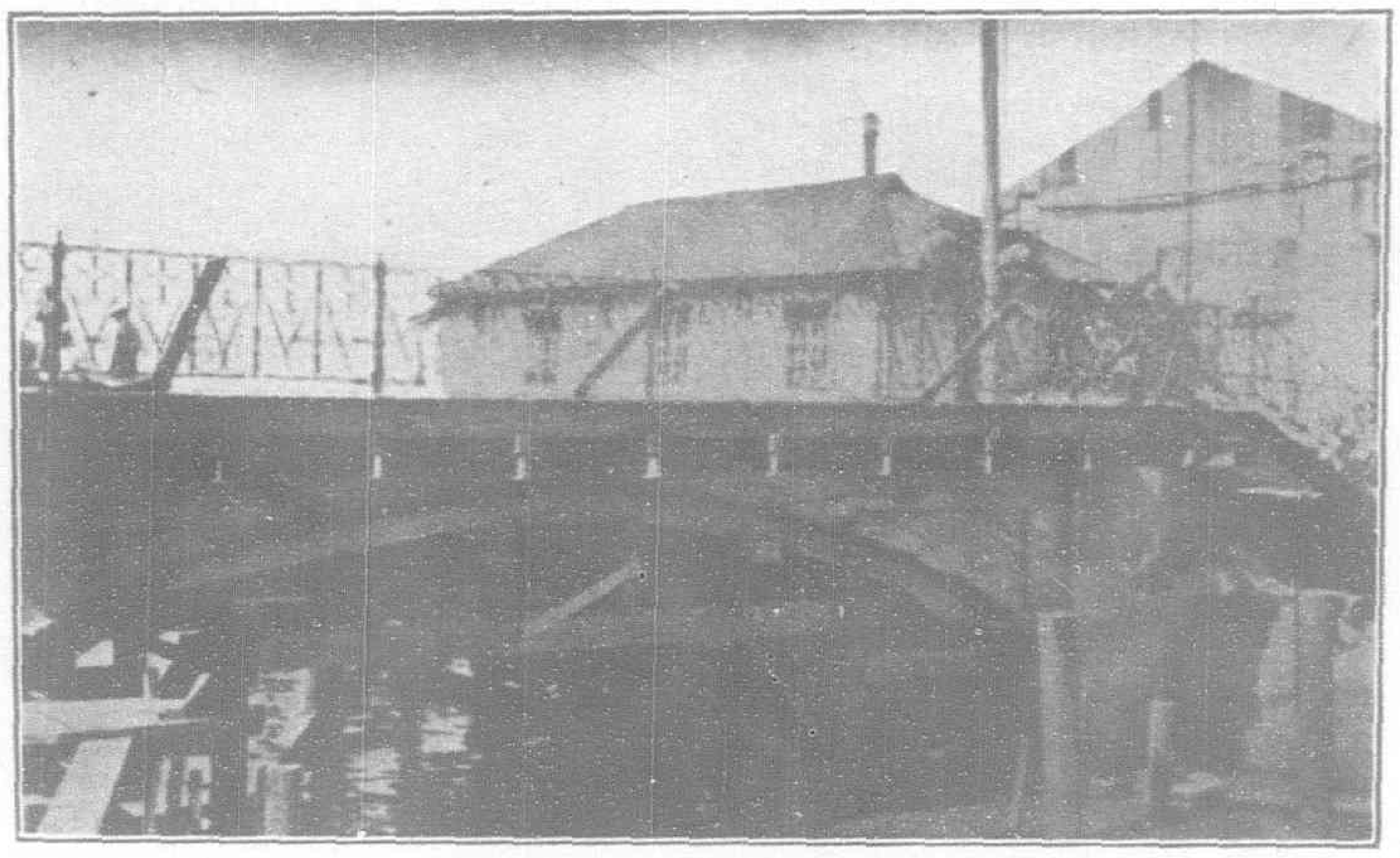
The entire drainage system of Intramuros was examined and cleaned, as were the



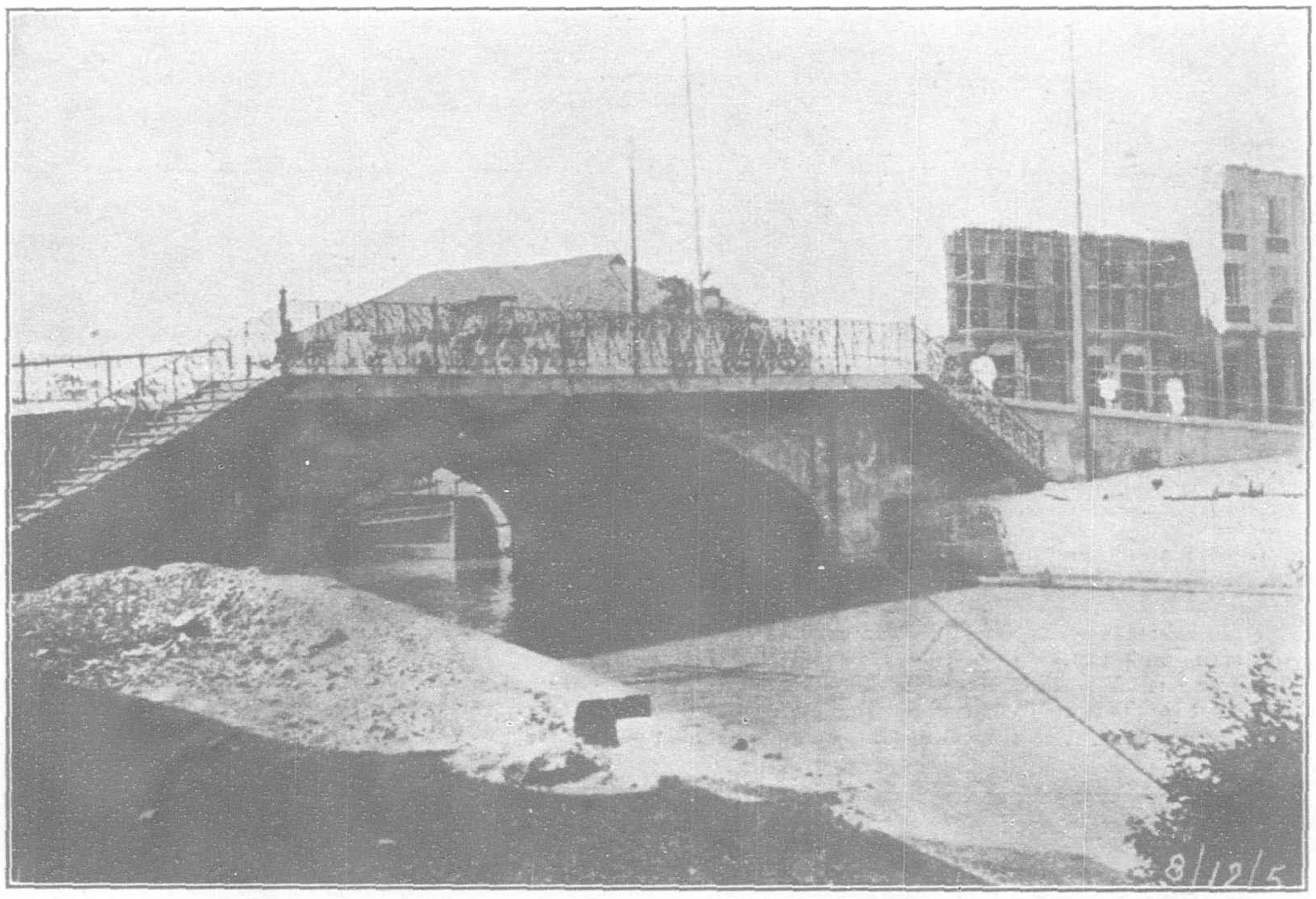
NEW AYALA BRIDGE



SAN MIGUEL CONCRETE STEEL-ARCH BRIDGE IN CONSTRUCTION



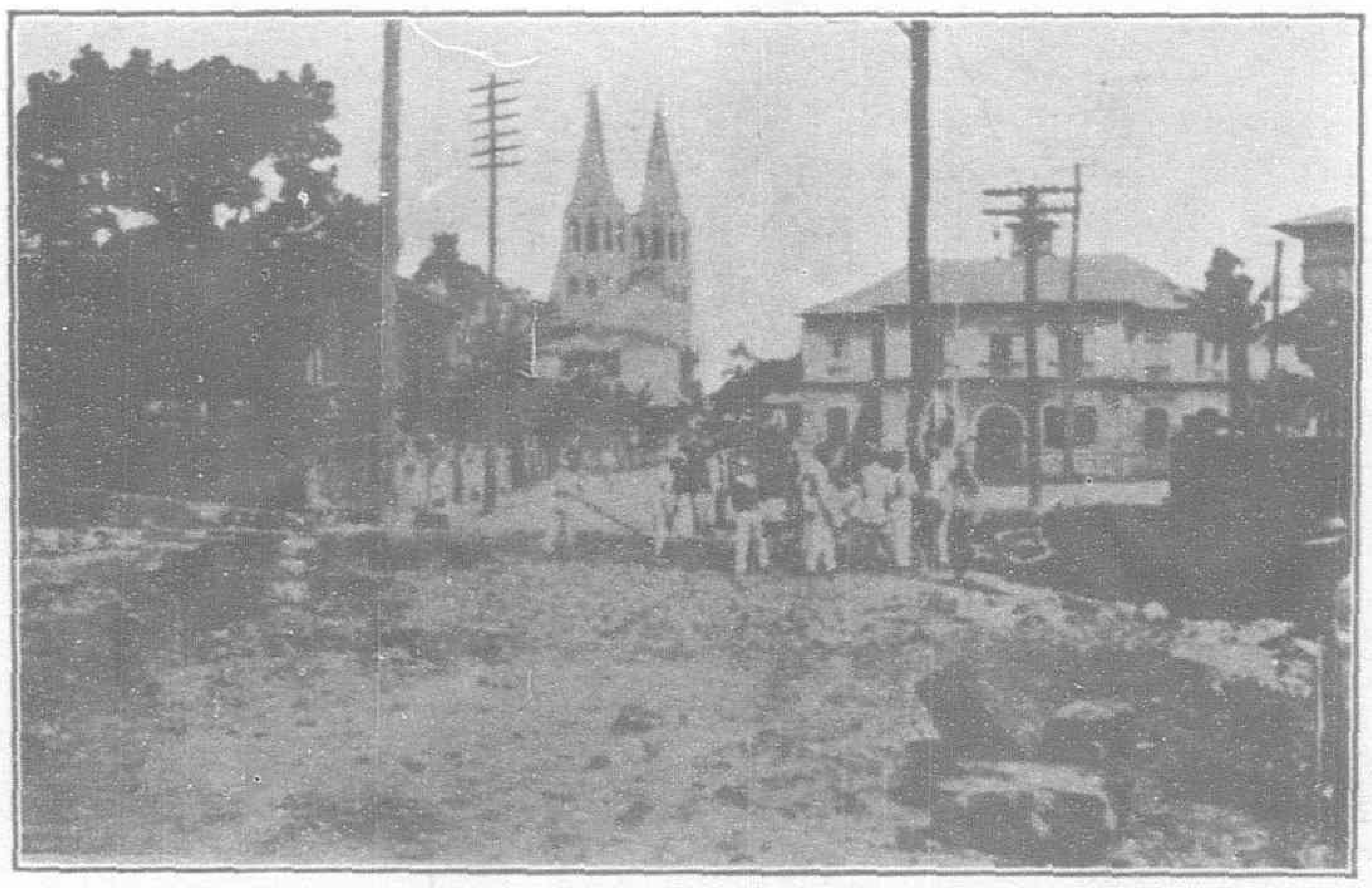
SAN MIGUEL CONCRETE STEEL-ARCH BRIDGE IN CONSTRUCTION



SAN MIGUEL CONCRETE STEEL-ARCH BRIDGE

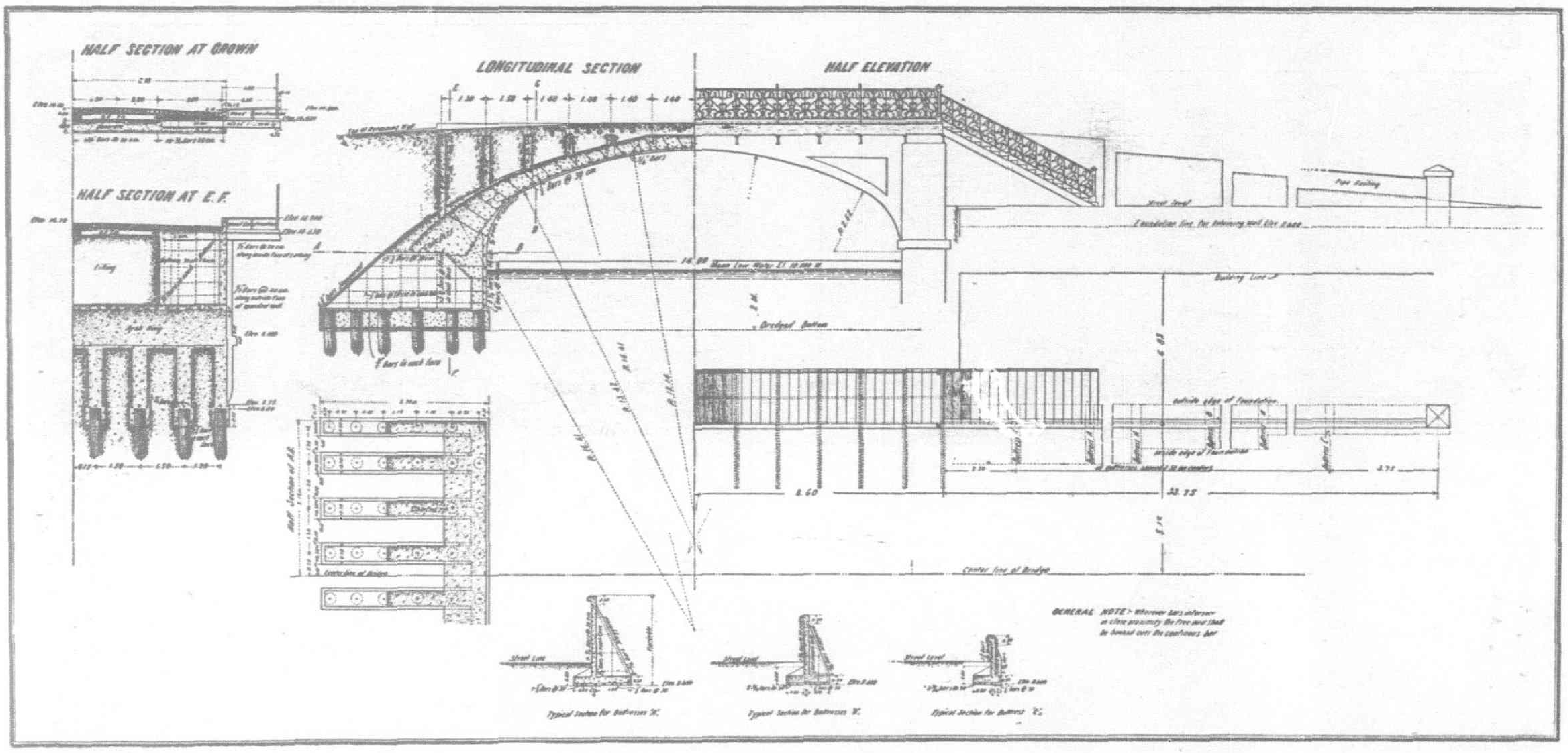
drainage systems of parts of the districts of Binondo and Quiapo. The work required in Intramuros clearly showed that these sewers had been neglected for many years. In all, 2,000 cubic meters of material were removed from the sewers. This deposit consisted in the most part of sand and stone from street washings, mixed with putrifying vegetable matter. Silt basins, which served to prevent the entry of street washings, are useless unless thoroughly and regularly cleaned; so that their construction in inlets, except in particular instances, are inadvisable, as in this climate they would cause nuisances.

The temporary sewers in the moat were cleaned and repaired where necessary. Careful investigation of their condition shows that they can not much longer remain without exten-

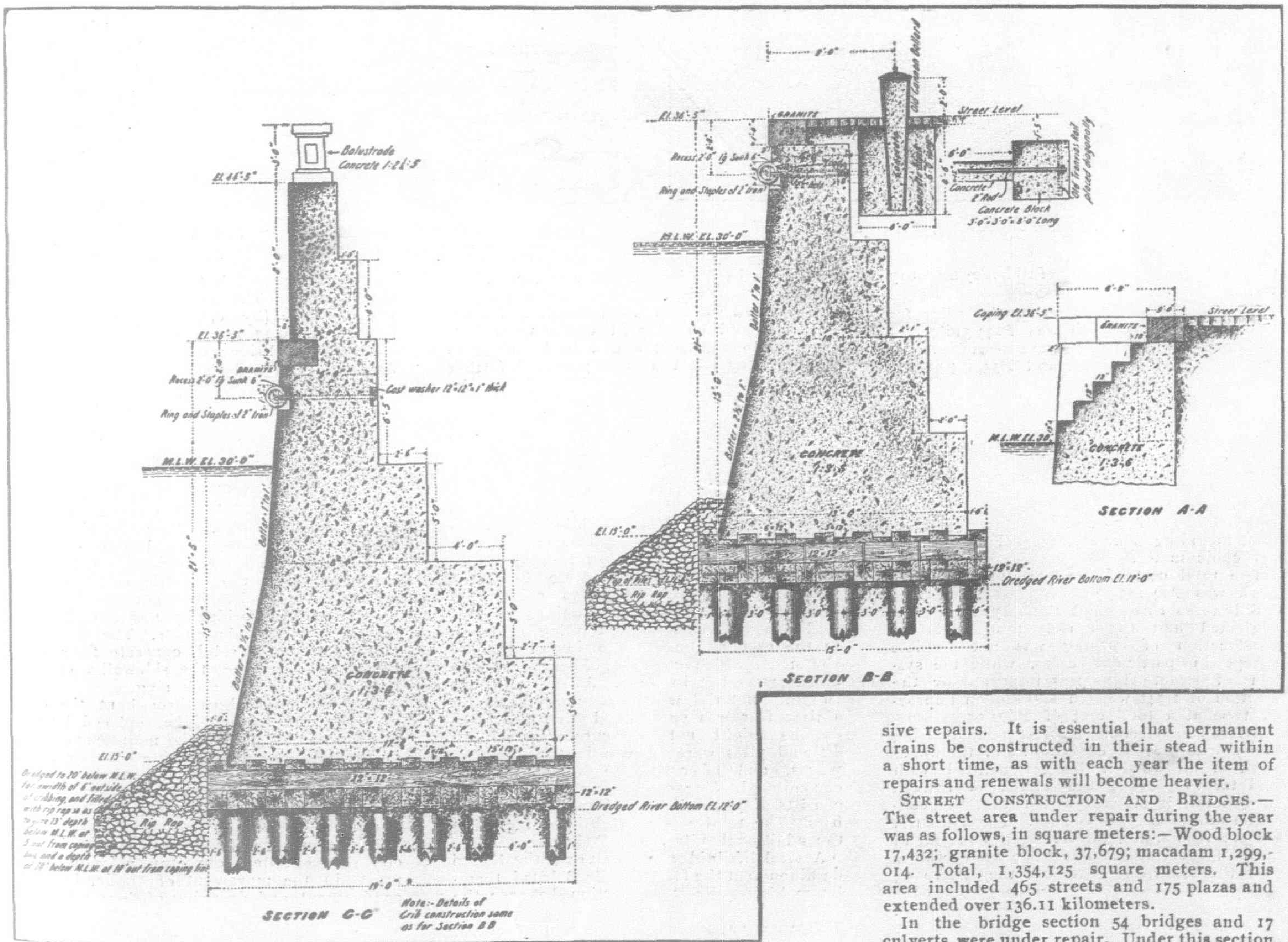


CALLE TANDUAY BEFORE REMOVAL OF BRIDGE AND LOWERING OF PIPE LINE

CALLE TANDUAY AFTER REMOVAL OF BRIDGE AND LOWERING OF PIPE LINE



PLAN OF CONCRETE STEEL ARCH OVER SAN MIGUEL ESTERO



PLAN OF WALLS FOR THE PASIG RIVER

sive repairs. It is essential that permanent drains be constructed in their stead within a short time, as with each year the item of repairs and renewals will become heavier.

STREET CONSTRUCTION AND BRIDGES.—The street area under repair during the year was as follows, in square meters:—Wood block 17,432; granite block, 37,679; macadam 1,299,-014. Total, 1,354,125 square meters. This area included 465 streets and 175 plazas and extended over 136.11 kilometers.

In the bridge section 54 bridges and 17 culverts were under repair. Under this section also the operation of the Binondo lift bridge

SEWER CONSTRUCTION, CALLE SOLER

ROAD OVER PIPE-LINE RIGHT OF WAY, NEW WATER SYSTEM, LOOKING TOWARD MANILA FROM MARIQUINA HEIGHTS

falls, and the construction of all heavy masonry walls.

The total cost of operating the office for the supply of material was ₱143,516.41, of which amount ₱61,579.60 were spent for labor, ₱26,902.29 for launches, and ₱55,034.52 for scows. The cost of broken stone produced at the quarry was as follows: Stone crushed, 49,954.03 cubic meters, unit cost, ₱1.33 per cubic meter (in the bins); launches, material towed, 54,657.60 cubic meters, at ₱0.47 per cubic meter (includes gravel towed; scows, materials handled, 54,567.60 cubic meters, at ₱0.86 per cubic meter (including gravel handled). Total cost of stone on shore, Manila, including wear and tear of plant, ₱2.56 per cubic meter.

The total cost of transportation for street work was ₱64,225.39.

Sidewalks throughout the city have been neglected and through lack of funds the construction of curbing was not possible except in particular cases, while the system of street signs was improved by the erection of 1,541 wooden signs of an improved type at a total cost of ₱674.95.

All iron and steel bridges were painted during the year to prevent corrosion, and the woodwork of all wooden bridges painted with coal tar to prevent the attack of insects. In general, it may be stated that the condition of the bridges is poor. The Palomar, the Azcarraga, and Bilibid bridges are all in need of rebuilding. The stone arch bridges over the Estero de Paco and the Estero de Quiapo are in need of major repairs, as the arch rings show positive signs of movement.

The use of the Bridge of Spain by the electric street railway has undoubtedly injured the arches, as great vibrations are now noticeable in the bridge under traffic. These arches will surely not long bear such severe stress as now imposed upon them, and some means should be adopted either to replace them or to construct a new bridge close to this crossing. It has been proposed further to increase the headroom of this bridge by raising the arches in one or two spans, so that launches may at all times safely pass under it. This will be an expensive repair and may prove to be inadvisable upon investigation.

A reinforced steel concrete arch of 14 meters clear span with a clearance of 4 meters above mean low water and width of 10 meters between curbs has been built over the Estero de San Miguel, under contract with Messrs. J. G. White & Co., Inc. Sidewalks of a width of 1.85 meters were bracketed from the arch, and stairways constructed leading to them. The foundations of this bridge are for the most part piling, although in the east abutment a portion of the old abutment, which consisted of heavy concrete blocks, was left in place. At several points running material was encountered, and for a time fear was entertained that the foundations might not be secure. Several additional piles were driven in the doubtful places, and after that no difficulties were encountered. The reinforcing of this bridge consists of 37,500 lbs. of ¾ and ½″ Johnson bars. The total cost of the bridge, including the additional piles, was ₱36,029.

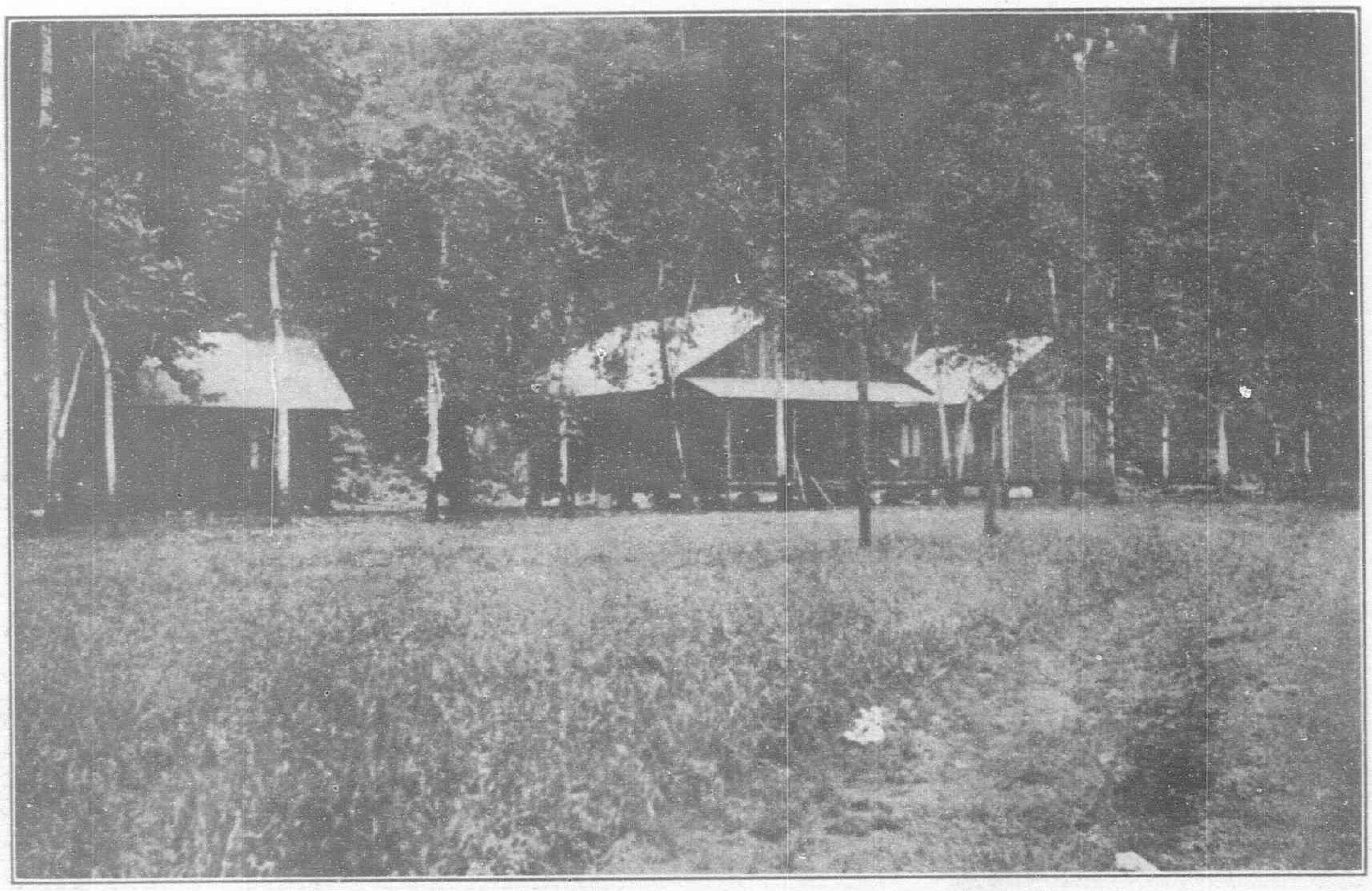
A steel lift bridge was built over the Estero de Binondo at the foot of Calle Soledad, thereby making a direct connection between the business district and the Custom-House. Traffic observations were made at this bridge, nad upon the average of a day of 24 hours 13,400 pedestrians and 1,382 vehicles pass over the bridge, while 141 cascoes pass beneath the platform. The average cost of lifting the platform (by electricity), exclusive of repairs, is ₱0.27 per lift.

The Ayala Bridge was constructed by the Atlantic, Gulf and Pacific Company.

Several of the city bridges are in need of widening, particularly those on Calle Tanduay and on Calle San Sebastian. With the opening of the Ayala Bridge traffic along Calle Tanduay has been increased and some additional provision is recommended for its accommodation. Widening may be effected by the construction of I-beam sidewalk brackets set in concrete above the arch ring at a very small expense. The bridge on Calle San Sebastian has been a danger point since the opening of the electric street railway system. A plan has been completed for the widening of this bridge by means of I-beams set on auxiliary abutments. The intention is to construct a solid concrete floor over these. and to make the sidewalks entirely independent of the arch ring.

The wooden bridges throughout the city, says the report, should be replaced by permanent construction. The maintenance cost of these bridges is becoming excessive, and funds should be allowed for their replacement. Wherever possible, a concrete steel bridge is desirable, as the maintenance cost is practically zero.

The occurrence of numerous esteros in the city gives excellent opportunity for improvement in the movement of traffic, but the confinement and dredging of these esteros is necessary in order to realize this condition. These esteros should be dredged to accommodate boats of at least 1 meter draft at lowest tide, and all bridges should have a



ENGINEERS' CAMP, HEADQUARTERS NEW WATER SYSTEM

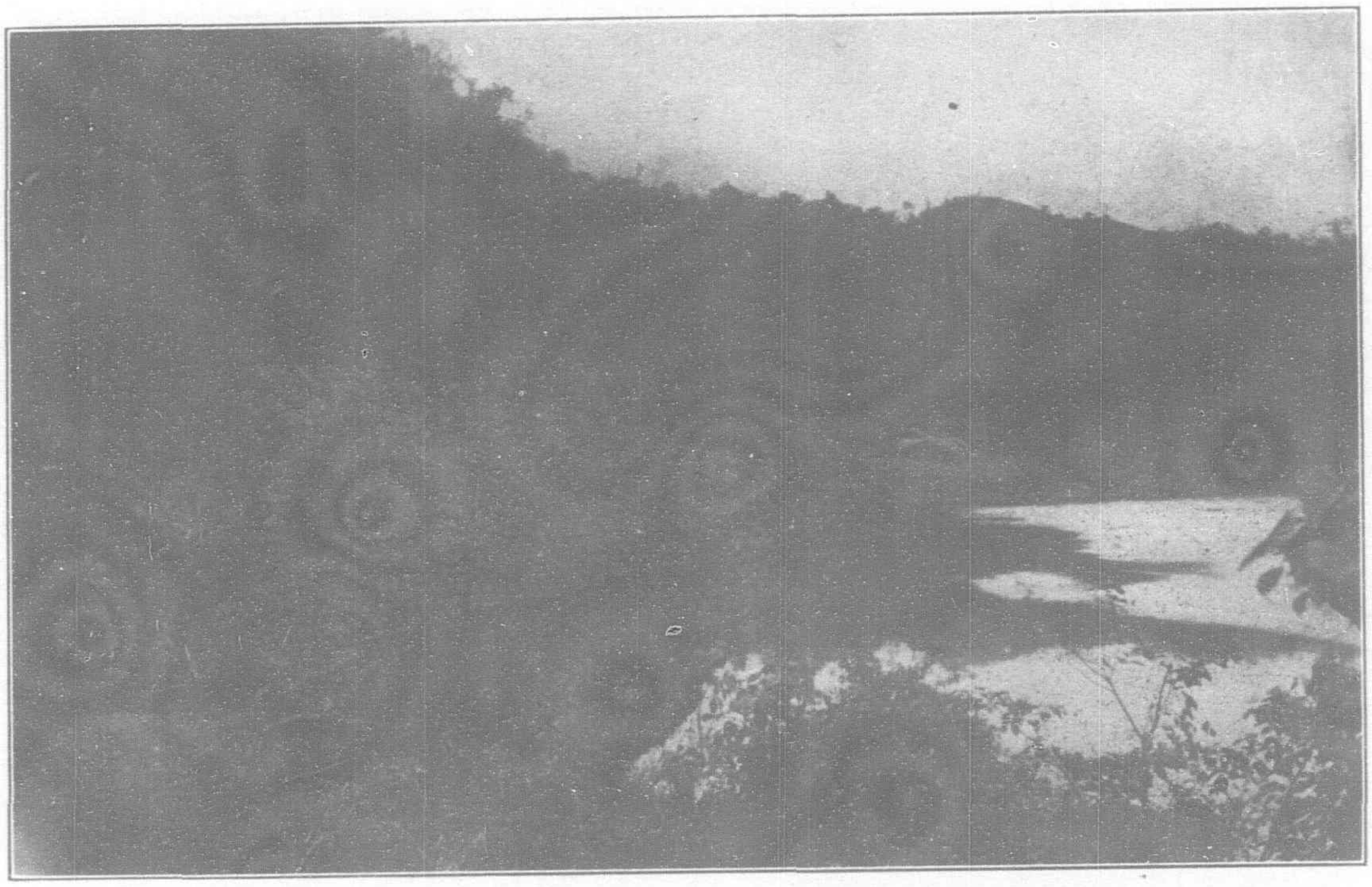
clearance at mean low water of at least 4 meters, to make possible a thorough use of these natural waterways. For this work a special design for a shallow wall has been worked out, but is not yet in satisfactory condition. A more extensive use of these esteros will be immediately economical for these reasons: First, the streets will be cleared of a large portion of the traffic; second, the cost of maintenance of roadways will be reduced; and third, a reduction in the clear width of the roadway will be possible, thereby saving original cost of construction. The dredgings secured will be available for street filling and for the filling of lowlands. By means of a hydraulic dredger lowlands close to the estero banks could be filled at small cost, and large areas of land at present unsuitable for building purposes would become available. Following the filling, greater receipts could be secured from taxes and the city would be benefited in still another direction. As this work is of great magnitude, it could not be taken up except in small sections, butt he esteros which seem to require immediate attention are the Binondo Estero, the San Sebastian Estero, and the Canal de la Reina.

With the development of building construction in the outlying sections of the city, the problem of properly maintaining an increasing area of streets is becoming a serious one. The stone available may be classed as fair, and unsuited to heaviest traffic. With each year the cost of repairs to streets already in existence becomes greater, even though the drainage has been improved by a proper grading in the gutters and by building the roadway with an adequate crown. The argument for permanent paving becomes stroning every day, and undoubtedly it will be cheaper re the end to provide permanent pavements in streets where traffic is heavy, extending the work as conditions warrant to other sections.

City Shops.—All buildings within the shop inclosure are in good condition. A small drying kiln, with capacity for 1,000′ of lumber, has been installed. During the first nine months of the year under review the shops were run to their fullest capacity. They are now equipped to undertake any kind of heavy wagon and machine work.

Department of Sewer and Waterworks Construction.—*Water Supply.*—The scheme of the system of water supply, due to J. F. Case, C. E., Chief Engineer of this department, takes the water for Manila from the Mariquina River at a point situated in the extreme suburb of the town of San Mateo, about 16 miles above Santolan, the intake of the present water-supply system. At the initial point of this work, by means of a dam and its corresponding gates, a section of the river is to be converted into a reservoir of 2,000,000,000 galls.' capacity, at an elevation of about 212′ above sea-level. One mile distant from

YLANG-YLANG GROVE AND ENGINEERS' CAMP, HEADQUARTERS NEW WATER SYSTEM



ROAD CONSTRUCTION, NEW WATER SYSTEM, SHOWING HEAVY ROCKWORK

El Deposito de San Juan, at a point situated about 112' above sea-level, another reservoir of about 50,000,000 galls. will be built, from which the water will be distributed to the city, the present reservoir of 16,000,000 galls.' capacity remaining as a reserve deposit.

From the dam to the distributing reservoir the water will flow by its own gravity, passing through iron pipes of 42'' in diameter for a distance of 10½ miles, wherein the force of gravitation exacts strong, resistant piping, and through a cement-built tunnel for a distance of 4½ miles wherein the water will flow on the hydraulic gradient and no great resistance in the walls of the conduit is required. This tunnel section begins at the distributing reservoir and extends 4½ miles therefrom.

The water from the distributing reservoir will be carried by means of the present system, plus the necessary increase, so that the most extreme suburbs of the city will be amply supplied.

This scheme is to be carried out by contracts for the construction of the work and for the supply of the necessary material, in three separate divisions which shall, respectively, comprise:

1. (*a*) Dam and head works; (*b*) furnishing steel plates and rivets; (*c*) manufacturing and laying steel pipe; (*d*) tunnel and conduit; (*e*) reservoir and gatehouse works.

2. Works comprising storage reservoir above the dam, certain masonry bridges, culverts, etc.

3. The extension of the distribution system throughout the city; but the extent of the same can not be determined in advance, because it depends upon the remaining appropriation for the two previous sections.

On January 2d, 1906, the day appointed for the opening of the bids, American companies exclusively presented bids, and the contracts for the above-mentioned sections were awarded as follows:—

Item.	*To whom awarded.*	*Amount of bid.*
Construction of dam (*a*)................	Matson, Lord & Belser Company......	$241,510.25
Steel plates (*b*)......	Henry H. Peabody & Co...............	99,900.31
Steel pipe (*c*)........	Atlantic, Gulf and Pacific Company..	281,935.00
Tunnel (*d*)....... ...	........do.....	179,987.50
Reservoir (*e*)........	Matson, Lord & Belser Company......	222,477.70
Total......................................		1,025,810.76

These works should be completed July 1st, 1908. Their present status is as follows:—

(*a*) Work was commenced in this section before any of the others, on July 20, and progress therein has been retarded owing to the rainy season.

(*b*) Delivery of materials of this section has not yet begun.

(*c*) At the point of intersection of the Pasig and San Juan rivers the contracting company has established a steel-pipe factory.

(*d*) Work has likewise commenced in this section.

(*e*) Work has likewise commenced in this section.

The specifications and details of the work comprised in part 2 are already almost completed, but they will not be offered for bids until those of part 1 are very much more advanced.

The survey of the line of road and the tunnel through and whereon the piping is to be laid, as likewise of the other lands to complete the scheme for this work, has been very laborious and has occupied to a great extent the force of this department during the fiscal year just closed, owing to the needful measurements, the interviews with the owners of lands expropriated and others to be expropriated, and the many questions always arising when it is sought to acquire lands in localities where occupation appears to be the sole title alleged to prove ownership.

In order to secure assurance that the material to be used in the work of construction be of the kind and conditions exacted in the specifications, a contract has been entered into with the Pittsburg Testing Laboratory for the manufacturing inspection of said material.

SEWERAGE SYSTEM.—The sewerage system scheme adopted is due to Mr. O. L. Ingalls, principal Assistant Engineer of the department, which scheme is devised solely to carry off sewage and the impure liquid matter from dwellings, factories, stables, etc. Rain water is not to be carried off by this sewerage system; this is to be accomplished by a general system of drainage entirely independent thereof.

The purpose of the sewerage scheme as outlined is to discharge all refuse matter into the harbor at a point situated opposite the mouth of the Pasig River, and at a distance of 6,500' from the shore, by means of a cast-iron force main 42'' in diameter laid below the bed of the harbor and supported by a pile foundation suitably constructed. The discharge into the bay will be accomplished by means of powerful centrifugal pumps placed at the end of Azcárraga street in a pumping station constructed for the purpose. Five additional pumping stations similar to the one described but with less powerful pumps will be required to handle the sewage in other parts of the city. These pumping stations will be distributed so that three will be located on the north and three on the south side of the Pasig River. Those stations located on the north side, including the one already mentioned on Azcarraga-st., will be located at the intersection of Paz and Arranque-sts. and also at Iris and Plaza de Santa Ana. Those stations proposed for the south side of the river will be located at the intersections of Nueva and Herran-sts., Bagumbayan and Nozaleda-sts., and Herran and Nozaleda-sts.

All sewage collected on the south side of the river will be conveyed to the north side for discharge into the bay by means of a double 24'' cast-iron pipe crossing the Pasig River under water. The scheme for the construction of the work and for the furnishing of all necessary materials will be carried out by two separate contracts which shall comprise, respectively:—

(1) The construction of approximately 52 miles of sewers, of which 7.5 miles will be composed of brick and concrete ranging in size from 4.75 feet in diameter to 2 by 3' egg-shaped sewer and laid at depths ranging from 12 to 18' below the surface, and 42 miles will be of terracotta pipe from 8 to 24'' in diameter and laid at depths of from 5 to 16'.

In addition to this there will be one 42'' cast-iron outfall pipe 6,500' in length, laid below the bed of the harbor on a pile foundation, besides one double line of 24'' flexible-joint cast-iron pipe 650' in length crossing the Pasig River.

(2) The construction of the six pumping stations and also the furnishing of all pumps, engines, and other necessary equipment therefor.

The necessary plans and specifications for that portion of the work which consists in the furnishing of materials, the laying of all pipes, and other described construction were submitted to the board for approval, and bids or proposals for doing the work were advertised on August 1, 1905, to be opened on January 12, 1906. On the opening of bids the Atlantic, Gulf and Pacific Company were found to be the lowest bidders, and contracted to do the work for $1,631,053.20. The contractors have chosen the main pumping station on Azcarraga-st. as the initial point for beginning work, at which point they have already completed about 200 linear feet of sewer. This work, in accordance with the terms of the contract, should be completed by July 1st, 1909.

At least two years prior to the date calculated for the determination of the sewer contract bids will be asked for the construction of the six pumping stations above referred to, and also the furnishing of all necessary pumps, engines, and other machinery therefor.

Especial attention has been given to a study of this problem during the fiscal year just closed for the purpose of ascertaining the most desirable system of engines and pumps to be used in the various pumping stations, in order that the expense for operation and maintenance may always be kept at a minimum amount. A considerable time has also been given to designing a screen chamber and a system of sewage screens which are intended for the purpose of separating and removing all bulky or floating substances from the sewage in order to prevent the clogging of the pumps or for hygienic reasons to prevent their becoming a nuisance in the waters of the bay.

It would seem opportune before treating this subject to call attention to the fact that the study and execution of all plans for a system of stormwater drains have likewise been entrusted to this department and that the expense therefor is to be charged against the $4,000,000 loan. This was agreed upon, but not without objection, for the reason that it was believed that the said $4,000,000 loan should be devoted exclusively to defraying the expense of the water-supply and sewerage-system construction in accordance with the provisions found in Act No. 1323, and that such a liberal interpretation of the act might prove to be cause for a lack of funds for the completion of these works.

The estimate of outlay compared with the income is as follows:

INCOME.

Amount of the loan	$4,000,000
Premium at the rate of $95,625 per million.	382,500
Total	4,382,500

OUTLAY.

Expense incurred up to June 30, 1906	380,000
Amount of contract for the water system:	
Part 1	1,025,000
Part 2	165,000
Part 3	400,000
Amount of contract for the sewer system:	
Part 1	1,631,000
Part 2	370,000
Contingent funds	150,000
Customs duties on the materials to be imported	100,000
Cost of inspection and supervision	150,000
Total	4,371,000

Comparing the total income with the outlay, a remainder of $11,500 is shown, which demonstrates a reasonable estimate of the cost of these works when completed.

STORM-WATER DRAINS.—This work is in charge of this department and consists of the establishment of a system of canalization, through which the storm water will run into the sewers, which in turn will empty it into the esteros or into the Pasig River. As the street levels in the city are so varied, the drains to be built will not be uniform. Some will be U-shaped, others of the horseshoe form, and still others round in their vertical section, to suit the peculiar features of the places wherein they are to be placed. The entire plan is not yet completed, but partially completed plans have already been made for the districts of Ermita, Malate, Santa Cruz, Tondo, Binondo, and Sampaloc.

Some of these sections are now being constructed, as may be seen by the following excerpt from the report of the Chief Engineer of this department:—

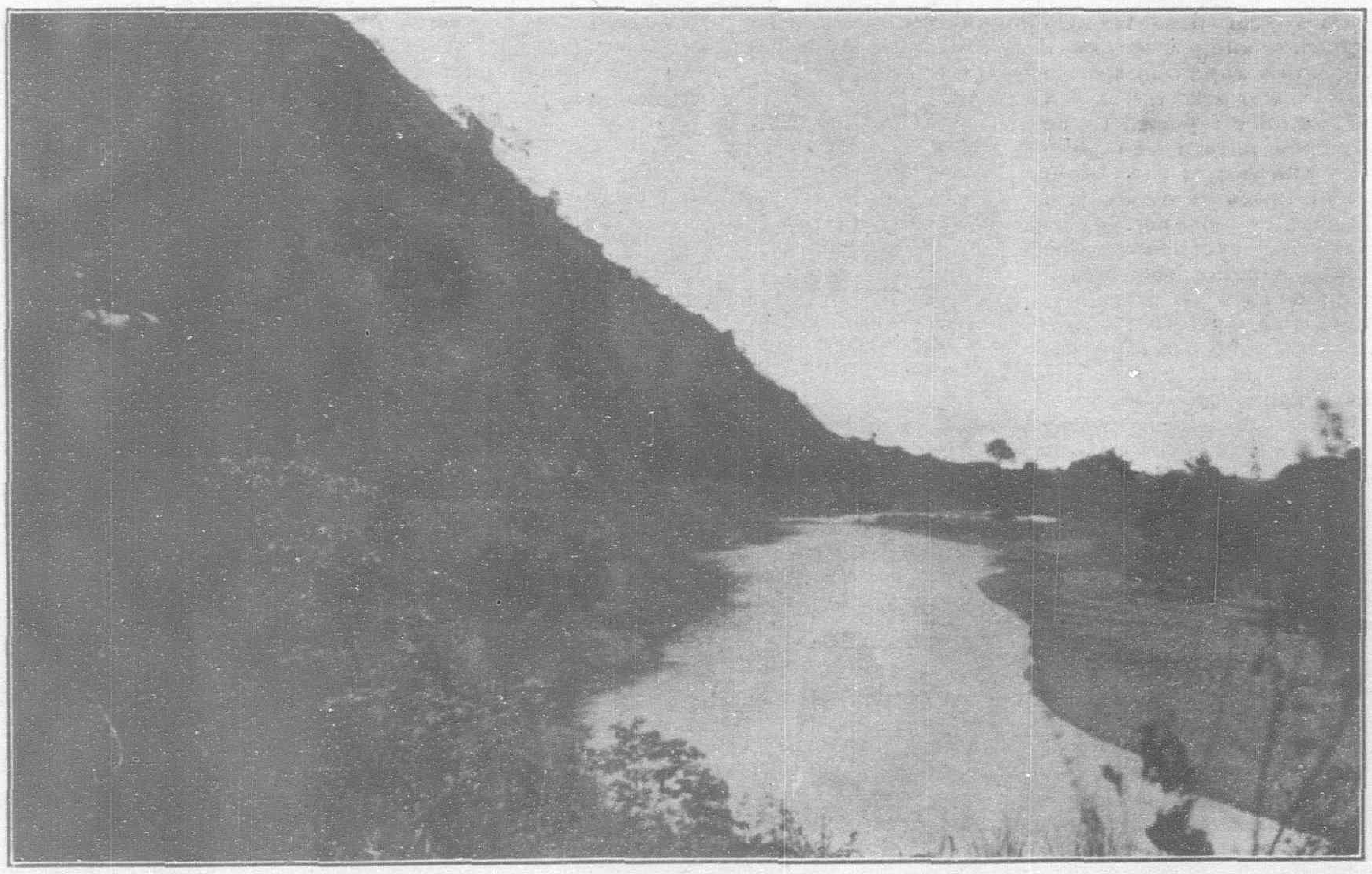
> Plans and specifications were prepared and proposals invited for a drain 270 meters in length and 5×6′ in section, running from the Malecon Drive, near the Legaspi Monument, through the proposed hotel site to the newly built bulkhead on the bay front. This work was built by the Atlantic, Gulf and Pacific Company, under contract, at a cost to the city of ₱29,000.
>
> Contract for the construction of a storm-water drain on Calle Santa Monica, Ermita, with laterals on adjacent streets, was entered into with Salvador Farré, the city supplying certain of the materials necessary. The total amount paid to the contractor was approximately ₱11,000. This work was completed in strict conformity with the specifications, and was in every way acceptable.
>
> A drain was also installed in Calle Soler, Santa Cruz, by Smith & Blossom, contractors, running from the Estero de Trozo to Calle Almansa, with laterals on Calle Misericordia and Calle Almansa. This work is not entirely complete, but will relieve and place in a comparatively sanitary condition a thickly settled district of approximately 30 acres.

It has been estimated that three years will be required in which to complete all sewer work.

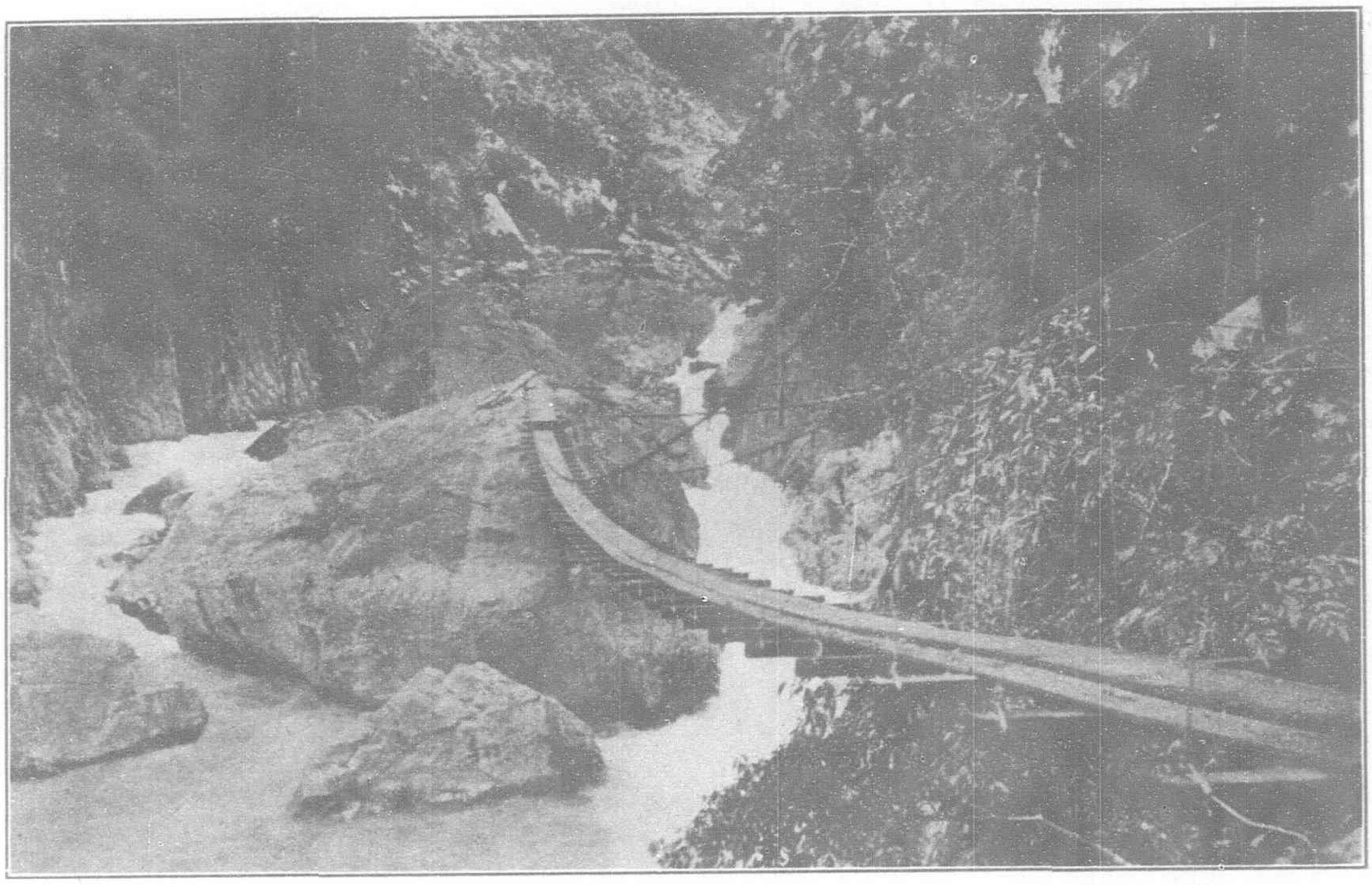
The introduction of a sewerage system and an increased water supply for Manila will prove a lasting benefit from a hygienic point of view and will be a most important factor in the material progress and future growth of the city. It is to be hoped also that these plans can be carried to completion at a cost not to exceed the estimate which has been placed at $4,000,000, in which event it may be asserted that the expense incurred in making these improvements has been incomparably less than those incurred by most cities of an equal population in either Europe or America for improvements of a similar nature.

REFORM OF THE PUBLIC LIGHTING SYSTEM.—While this subject does not come under the head of either the Department of Engineering and Public Works or the Department of Sewer and Waterworks Construction, it is given place on account of the engineering features it contains.

About the middle of the year under consideration, a committee on electrical illumination and installation presented a plan for the reform of the public lighting system which has received the close study of the Municipal and Advisory boards and has been approved in part. This plan was described in detail and illustrated by a map of the city, showing the location of all poles and lights, as well as the proposed location of extensions. It was prepared by a committee composed of the City Electrician, Superintendent of Buildings, and the Committee on Electrical Installation and Illumination. Owing to the peculiar conditions surrounding the implantation of Civil Government under the new Charter of the City of Manila, the public lighting system necessarily has been more or less of a patch-work job. To the lights which were found in the streets at the time of the American occupation additions have been made from time to time in many parts of the city, wherever urgently necessary, to the extent warranted by the limit of available appropriation. The original lighting was supplied under con-



ROAD LEADING TO DAM SITE, NEW WATER SYSTEM, LOOKING DOWN STREAM



GORGE BELOW DAM SITE, HEADQUARTERS NEW WATER SYSTEM

tract by La Electricista and consisted of arc and incandescent lights. The incandescent lights have never been satisfactory, and, as far as possible, they have been eliminated and substituted by the arcs. The franchise of the Manila Electric Railroad and Light Company to construct, maintain, and operate an electric light, heat, and power system in the city of Manila and its suburbs was granted on March 24th, 1903, and this company assumed the existing contracts of La Electricista with the city. The Manila Electric Railroad and Light Company has diligently prosecuted the work of improving the public lighting system and has substantially coöperated with the Police and Fire departments in the repair of old lines and in the renewal of unsatisfactory or deteriorated lights. In order to correct faulty lights and interruption, the Police Department is required to promptly report over the alarm system all lights burning dimly or extinguished and all breaks in wires and fixtures. In this way every section of the city is constantly under observation and any irregularities are at once reported to the police headquarters. These in turn are reported to the contracting company and in almost every case repairs and renewals are made in a prompt and satisfactory manner. This system of correction is giving excellent results. A large part of the old system has been rebuilt and during the last few months new lines have been constructed and fed from the new power station, thus gradually reducing La Electricista service, which it is proposed to ultimately suppress. The system today is vastly superior to what it has been in any other year since the American occupation. The total number of incandescent lights of the street-lighting system paid for from city revenues is 936, at a contract price of ₱27.27 *per annum* per light, and 302 arc lights of 2,000 candlepower, exclusive of the harbor lights, matadero, and other interior lights at a contract price of ₱196.36 *per annum* per light. The total cost of the public lighting system, exterior and interior, for the fiscal year 1906, was ₱108,208.98, which sum, in view of the service rendered, is believed to be cheaper than in any other American city of approximately the same population and area.

After a carefully observed experiment of fifty inclosed arcs, which were installed in February, 1906, in the districts of Paco, Malate, and Ermita, this new inclosed arc was adopted by the Municipal Board as the type for future extensions in the public lighting system.

The plan for the reform contemplates the elimination of all incandescent street lights. The present annual cost of this class of light, consisting of 936 lamps, paid for from city revenues, is ₱25,524.72. As rapidly as possible the incandescent lights will be suppressed and the arcs substituted therefor, up to the limit of the appropriation. If the Commission approves the amount fixed in the estimate of the Municipal Board, there will be in addition to the sum formerly applied to the payment of incandescent lights about ₱6,000, which may be used for such extensions as may be deemed most necessary. In view of the much reduced strength of the police force, every improvement in the lighting system will operate not only to the benefit of the public directly but it will be of material aid in the maintenance of order.

ELECTRICAL WORK.—Twenty-one new fire-alarm boxes were installed during the year, bringing the total now in use up to 153 street alarms. Two auxiliary fire-alarm systems installed in the Custom-House and the Government Laboratories were connected to the city system. Extensions were made from Calle Peñafrancia and Real in Paco to the military road at Santa Ana and along Calle Peñafrancia four blocks toward Pandacan; from Calle Herran along Calle H to San Andres; from Calle E along Isaac Peral to San Jose; from Calle Misericordia along Obando to Espeleto; from Paz (Santa Ana) along San Rafael to the water main; Calle Pavia to the Cotton Mills; Calle Soledad to Barraca; Magdalena to O'Donnell; Azcarraga along San Jose to Soler; and other short lines have been built from Lardizabal, Singalong, Carriedo, Principe, Magdalena, Aceiteros, and Soledad.

The police alarm has given perfect satisfaction in constant operation on a three and five minute schedule. Sixty-two police boxes were installed and the extensions covered a large portion of the outlying districts of the city. Several portions of the police and fire alarm circuits were rebuilt and 364 50′ poles were set. All the shorter poles, which were taken out of the interior of the city, where a greater height is required, were reset in the outlying districts. The entire construction of both systems is now standardized and in first-class condition. Nine poles were broken by the typhoons, but they were cut to 35 and 40′ lengths and used on the suburban extensions.

The change in the public and private lighting current from 110 to 220 volts has materially increased the inspection duties of this branch of the department. About 350 installations yet remain to be remodeled to the 220-volt current; 2,847 permits were issued for remodeling and for new installations, and 2,427 for certificates of inspection.

VISAYAN (P. I.) RAILWAY PLANS

Governor-General Smith, of the Philippines, has approved the plans of Messrs. J. G. White & Co., Inc., engineering contractors for The Philippine Railway Company, for the construction of lines in the islands of Cebu and Panay, as far as they have been prepared, with the understanding that the approval shall not be considered as an approval of the cost of construction or of any cost of construction whatever. In setting his seal on the plans, the Governor-General said:—

"This profile is approved, it being understood that the style of culverts and bridges used must be the most economical consistent with permanency, the cost of construction to be reasonable, ravine sections for bridges over navigable streams to be submitted for approval as required by the rules and regulations dated October 10th, 1906.

"This approval shall not in any way be considered an approval of cost of construction or of any cost of construction whatever.

"The approval of such cost of construction is reserved until such time as the work has been completed and a statement of the actual cost incurred has been submitted for approval."

The following endorsement is over Supervising Railway Expert Molitor's signature:—

"This profile represents in my opinion the most economical and proper grade line over the route between Iloilo (Panay) and Pototon.

"The bridges as indicated thereon are for the type stated, that is, permanent steel structures, properly located and described thereon with the exception of those over navigable rivers, regarding which I withhold any opinion until ravine sections are submitted to indicate in detail the arrangement of spans proposed.

"I also withhold any opinion or advice on the question of culverts until further information as to the relative cost of alternate designs is submitted. In using the term *permanent bridges* it is understood to mean bridges of steel supported on masonry or concrete piers. Economy of construction could be further observed by the use of piles or formed trestles wherever the construction of such bridges would be likely to withstand the currents in time of flood."

PERSONAL SKETCH OF JAMES GILBERT WHITE

PRIME MOVER OF THE LARGEST CONSTRUCTION ORGANIZATION IN THE WORLD

[In a recent issue of his well-known technical journal, published in New York City, the editor of "Cassier Magazine" contributes a biographical sketch of Mr. J. G. White, President of J. G. White & Co., of New York, London, Montreal and Manila. Mr. White is one of the strongest personalities to be found in the engineering and financial world and the story of his life is all the more interesting because of the fact that he started with probably fewer chances than are enjoyed by the average boy of today. He was one of the first to back his belief in the future of the Philippine Islands by investing heavily here, and the five electric street railway, power and lighting system which Manila enjoys is largely the result of his initiative genius. Mr. White again came to the front when the Philippine Government offered concessions for the construction of a system of railroads in the Islands, with the result that the company he heads is constructing at the present time the lines on the islands of Cebu, Panay and Negros. J. G. White & Co. have also undertaken large harbor improvements in the Philippines with great success. Reports on the activities of his organization are to be found in every issue of THE FAR EASTERN REVIEW. *We give herewith a partial extract of this biography.*—EDITOR'S NOTE.]

James Gilbert White was born at Milroy, Pa., in 1861. His father was a clergyman, born in Western Pennsylvania, of Scotch, Irish and English stock. He was a man of high moral principles and living, more than usual intelligence, liberal ideas, and sturdy, independent thought.

In 1877, when he was 16 years of age, young White entered the Pennsylvania State College, taking the course in arts, and graduating the degree of A. B., in 1882. During the summer vacations of his college course he devoted a large part of his time to such engineering work of one kind or another as would give him a better appreciation of his college work and enable him to more thoroughly understand and appreciate the bearing of his scientific studies upon industrial life. His most extensive summer work was done in 1881, when he spent considerable time with a party engaged in surveying in Northern Pennsylvania, and later in the Civil Engineering Department of the Cambria Iron Company, of Johnstown, Pa. After receiving the degree of A. B., he returned to the Pennsylvania State College and concentrated his time upon civil engineering. Immediately thereafter he tested his newly acquired knowledge by putting in a summer on the reconnaissance and location surveys of a steam railroad in Central Pennsylvania.

He seems constantly to have been drawn from the class room into the field of practical engineering activity and back again to the class room. In 1883, he entered Lehigh University with the intention of studying mining engineering. While there, and during the winter of 1883-4, he became especially interested in electrical investigations, and finally determined upon making electrical engineering his life work. His final ambition, however, was not at once open to attainment; to his mind, his ground work in both practical and theoretical engineering had not been made complete.

In 1884 Mr. White entered upon his final work as a student in college. After the summer spent in Johnstown he entered Cornell University, specializing in electrical engineering and physics.

His work while at Cornell was highly gratifying and successful; in fact, he received a fellowship in electrical engineering, followed by the degree of Ph.D., conferred at the commencement of 1885.

In a measure, Mr. White may be judged fortunate in having accepted, after his graduation from Cornell, the position of instructor in physics in the University of Nebraska. It led him for two years to give his attention to what was, in a great part, a careful review of much of the work he had gone over while in college, with the added value of the constant suggestion which comes to the instructor from his contact with the inquiring minds of the students. It is not astonishing, however, in view of the disposition he had previously shown to make excursions into the field of practice, that he finally, in the spring of 1887, joined forces with others in originating the Western Engineering Company.

After the initial work in Nebraska and other Western States had developed considerable proportions, overtures were made by eastern interests which resulted in the Western Engineering Company being sold to the Edison-United Manufacturing Company, and Mr. White came to New York to take charge of the Department of Electrical Railway Installation covering the entire United States in the consolidated organization. However, the formation of the Edison-General Electric Company followed soon after Mr. White's association with the Edison-United Manufacturing Company, and Mr. White resigned to develop an engineering and contracting business of his own under the firm name of J. G. White & Co.

In 1900, after having carried out from the New York office and by several previous trips to London a considerable amount of engineering in Australia, Mr. White established an office in London, organizing for this purpose the English company, known as J. G. White & Co., Ltd.

During his engineering experience Mr. White has supervised the design and construction of a large number of power houses, both steam and water driven, as well as complete systems of track and overhead construction, bridges, electric light and railway distribution circuits, while a number of the more important installations have received his personal attention. Among these may be mentioned the Buffalo Niagara Falls Street Railway, and the transmission line from Niagara Falls to Buffalo. The former was built in 1895, and was one of the first high-speed interurban lines in America. It is believed to have been the first road to use the four motor equipment with series-multiple control now so commonly adopted for interurban service.

The transmission line to Buffalo was probably the first in America designed to carry so much as 5,000 h. p. on one set of wires, and consequently presented some new and interesting problems.

Work in progress under Mr. White's general direction also includes the construction of a large number of important buildings in Great Britain by the Waring-White Company Ltd., of London. These buildings include the Mercantile Marine Building, Ritz Hotel, and the Waldorf Hotel, in London, and the Royal Cotton Exchange, in Liverpool.

In South America, the activities now directed by Mr. White include the construction of rural tramways at Buenos Ayres, in the Argentine, the construction of a tramway system for Montevideo, in Uruguay, and the reconstruction of the city tramways and the erection of a modern power plant at Para, in Brazil. The White companies are also engaged in the construction and operation of electric light and tramway properties in Monterey, Mex., Havana, Cuba, and San Juan, Porto Rico. The construction of the Virginia & North Carolina Coast Railroad, which extends from Charleston, N. C., to Norfolk, Va., is included in their contracts.

The White organization consists of a number of companies independently organized, but closely allied. Of these, J. G. White & Co., Inc., of New York, may be regarded as the parent company. The development of allied companies has reduced the field of activity of this company until now J. G. White & Co., of New York, are engaged in an engineering, contracting, and operating business restricted to the United States and its dependencies, Mexico, and Central America.

J. G. White & Co., Ltd., of London, are carrying out a variety of engineering and contracting work in parts of the world other than Canada, the United States, Mexico, Central America, and Chili. The field in Chili is covered by the Chilian Contracting Company, of which Mr. White is president. The Waring-White Company, of London, is responsible for the construction of the fine modern steel structures erected on modern American building lines which have previously been referred to.

In Canada, the field is covered by the Canadian White Company, of Montreal. This company is very successfully inaugurating a general engineering business in the Dominion of Canada.

A great unanimity of purpose pervades the personnel of the White organizations. It is apparent, even to the casual observer. Mr. White is the source of this cohesive power. It resides in and emanates from him. He is a man of kind, helpful, and resourceful personality, of a type to be eminently responsible for the foundation of organized loyalty upon which the reputation of these companies has been built.

Mr. White is known to be a man in entire sympathy with all movements which look to the betterment of social conditions and the general uplifting of men, especially those of the younger generation. He is not a perfunctory member of clubs and other organizations, but takes an active interest in virtually all of those with which his name is associated. Among electrical engineers he is known as a man of generous impulses, and, in no small measure has lent active personal and financial support to important engineering movements.

COTTON IN KOREA

Mr. Ando, a Japanese expert, was commissioned by the Association of Cotton Growers of England to make experiments in cotton culture in Korea, and his report was recently issued. He says that in spite of the excessive rains in 1905 the Korean cotton crop did not average more than 60 to 70 per cent of a normal season, yet the experiment in Mokpo was remarkably favorable, the crop being double that of previous crops in the locality. Unfavorable results in other places he ascribes to lack of supervision. He considers the prospects very promising, and that if cultivation is extended throughout the country it will be of great value to the spinning industry in Japan. The general results of cultivation in Mokpo, where an agricultural expert was in charge, and at five places under Japanese farmers, he summarizes in this way: Upland cotton he thinks admirably adapted to the climate and soil in Korea. In Japan the excess of rain at the season of the bursting of the pod causes a certain amount of rot to set in, consequently reducing the yield, but in Korea the weather at this season is dry, thus insuring a safe crop. He thinks that while it is difficult at present to calculate the expense of growing manured cotton, a clear profit should be left of £2 2s. 8d. ($10.32 gold). Accurate figures are difficult to attain, but he puts the area under cotton at 298,200 acres. This is about 4.5 per cent of the total cultivated area of the country. The average crop seems to run from 427 to 215 lbs. Estimating the population of Korea at 14,000,000, and taking the consumption of cotton at 3⅓ lbs. ginned cotton per head *per annum*, he finds 46,000,000 lbs. used in the country. The import of ginned cotton and cotton wool, on a four years' average, is 1,428,000 lbs., the import of manufactured cotton is 18,850,000 lbs., while Korea exports 1,140,000 lbs. This shows the net amount of ginned cotton produced in Korea to be 26,862,000 lbs. The experiments at Mokpo tend to show that the introduction of upland cotton throughout the country would increase the output of ginned cotton by some 18,000,000 to 20,000,000 lbs.

RESUME OF THE GOLD-MINING INDUSTRY IN WESTERN SIBERIA

(L. Tovey, Imperial Institute of Technology, Tomsk, in "The Engineering and Mining Journal.")

Eastern Siberia is still a gravel-mining country, as vein gold is worked only near Vladivostok (Askold Island) and in two places in Transbaikalia. One of these mines is described by E. D. Levat in his *Or en Sibérie Orientale*, 1897, and the other is a new and promising property in the Shilka Basin, worked by some English capitalists who were enlarging last winter their power plant by putting up hydraulic and electrical machinery and in general doing serious equipment work.

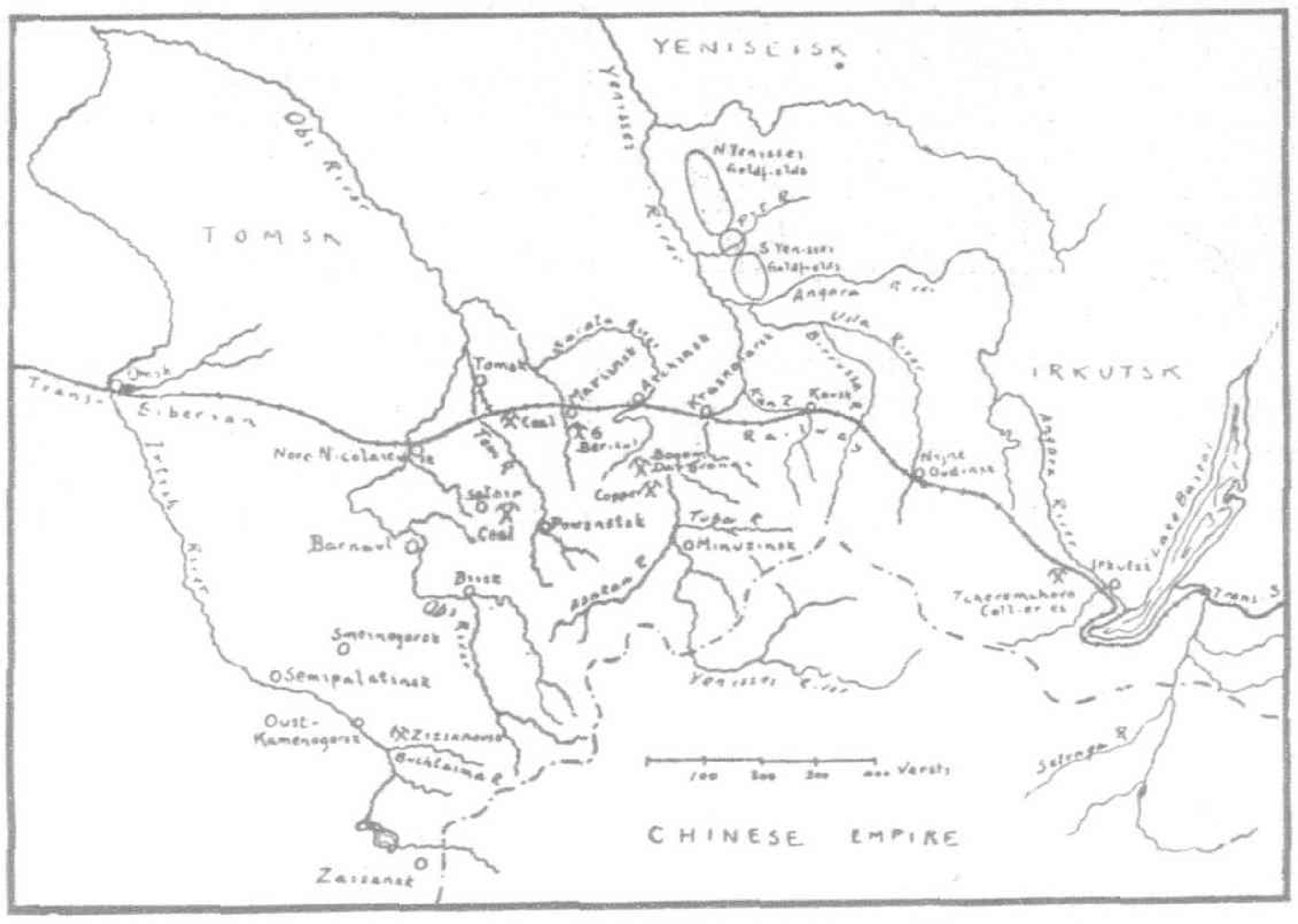


FIG. I.—MAP OF THE WESTERN SIBERIA GOLD AREAS

Much more important as a quartz-mining country is the western part of Siberia, the so-called Tomsk mining region, sub-divided into seven mining districts inspected by mining engineers under the Tomsk Mining Direction. This region comprizes all Western Siberia and the Yenissei Government of Eastern Siberia. Here gold mining is at present in a state of transition from gravel to vein mining. Gravel mining is decreasing as steadily as quartz mining is increasing in nearly all the mining districts except the Yenissei, where quartz mining is not in favor among the local miners, first, because two very promising mines brought ruin to their owners in the early nineties (for reasons having no connection whatever with industrial conditions) and, second, because general attention is drawn to the very successful work of dredges. Some of these are of the New Zealand type, made by Cutten Brothers, introduced into Siberia by Goodkoff & Hein, of Krasnojarsk, and others are of the Bucyrus type, first introduced by J. L. Perelmann, of St. Petersburg, and built by the Putiloff Works at St. Petersburg. Hoping to return to dredging operations in Siberia later on, we will confine ourselves to general conditions of the industry and the further development of quartz mining.

Data for the last five years have been compiled from the statistics of the Tomsk Mining Direction and those published by the Mining Department in St. Petersburg:

Total Gold Output of the Tomsk Mining District.

Year.	Character of Mines.	Tons of Quartz or Gravel.	Output of Gold. Oz.	% of Total Output.
1900	Quartz	25,081	9,976	5.5
	Gravel.....	7,201,455	171.816	94.5
	Total....		181,792	100.0
1901	Quartz	26,914	25,120	12 7
	Gravel	7,101,045	171,929	87.3
	Total....		107,049	100.0
1902	Quartz	25,483	26,811	18.5
	Gravel.....	5,493,823	118,195	81 5
	Total....		145,006	100.0
1903	Quartz	41,766	38,736	29.7
	Gravel.....	5,585,976	91,569	70 3
	Total....		130,305	100 0
1904	Quartz	61,420	49,654	38.0
	Gravel, ...	6,842,447	81,096	62 0
	Total....		130,750	100.0

The above table shows a general decrease in the output of gold in the mining region, the difference between the output of 1900 and 1904 being 28.1 per cent. The greatest difference between two successive years is 26 1 per cent between 1901 and 1902. The difference between 1902 and 1903 is only 10.2 per cent, while 1904 shows an insignificant increase of the whole output compared with 1903. The decrease of the total output is wholly due to gravel mining, as quartz mining shows a steady growth, in output, the yield of 1904 being four times that of 1903.

Of the several mining districts where quartz mining has reached any importance, Mariinsk and Achinsk are successful producers, Oust-Kamenogorsk and Zaisansk are promising beginners, while the results obtained in the rich Minusinsk district are far from satisfactory. This last fact is due to the circumstance that most of the claims in that district both east and west of the Yenissei River are in the hands of penniless people who hope to sell their claims, as they themselves are unable to do anything with their properties. During the last summer (1905) even the Minusinsk District has shown a considerable improvement and the Bogom Darovanni mine, named after the rich mine of K. T. Ivanitzki in the Achinsk District, seems to be a promising producer. In general, in spite of the war with Japan, which closed the Siberian Railroad for almost all private goods, and consequently greatly retarded the delivery of new equipment for the gold mines, the industry has not stopped increasing, and there is every reason to expect that, as soon as the country shall come to an end of its present inward troubles, gold miners will do their best to make up for lost time.

If from the statistics of the industry we pass to the conditions and methods of work we must notice that they are far from being perfect, though not quite as hopeless as some would picture them. As work is confined exclusively to the outcrops of rich veins, very little sampling is done, and this little is far from the systematic sampling to which miners in the United States, the Transvaal and Australia are accustomed. Another reason is that the richer mines are owned by people who work them on a moderate scale, confining themselves to the richer veins without troubling about treating tailings and concentrates. This is especially noticed in the gash veins that have been in some places extremely rich and have incited diligent search for more veins; as this surface prospecting was often successful it did not compel the miners to look deeper down nor to benefit by the work on the first discovered veins. The market price of mines is to a certain degree influenced by the last year's output. Certainly it is a very poor method of estimation and may be explained only by the gold miner's proneness to take risks. Quite lately there is a certain improvement even in this respect, as some of the richer miners find it useful to estimate their ore reserves in order to control their outlay on equipment. Others find it even useful to employ a mining engineer to make an estimate of the mine before taking an interest in it.

Mining plans and vertical sections of gold mines are kept more or less in good order, as a plan, to the scale 1:500, is required by the mining code. Besides this, every claim has an official plan to the scale 1:8400, or 1 in. to 100 sagenes (1 sagene=7 ft.) delivered to the owner by the local inspector of mines, and serving as a proof of the rights to the ground. Besides these compulsory plans, most of the owners have working plans to larger scales, but these seldom contain systematic data about the character of the deposit and the value contained. As local mining congresses and the consulting office of gold and platinum miners with members elected by the local congresses, having its seat in St. Petersburg, have of late paid considerable attention to the question of mining plans, there is reason to hope that in a few years most of them will adhere to a general standard.

As most of the mines in the Mariinsk and Achinsk districts can be worked by adits from gulches, almost no pumping is required. As timber is not dear, timbering in the mines is is more or less satisfactory; in some cases, however, there is a certain overtimbering, especially in the stopes. In veins not thicker than 7 to 8', stoping, without filling the stopes with rack, though not desirable, can still be tolerated; but when the vein reaches 20' or more, this method is to be condemned in the most resolute manner, so much the more since filling is not more difficult or expensive than the extra timber used when the stopes are filled with cribs. Some of the miners working thick

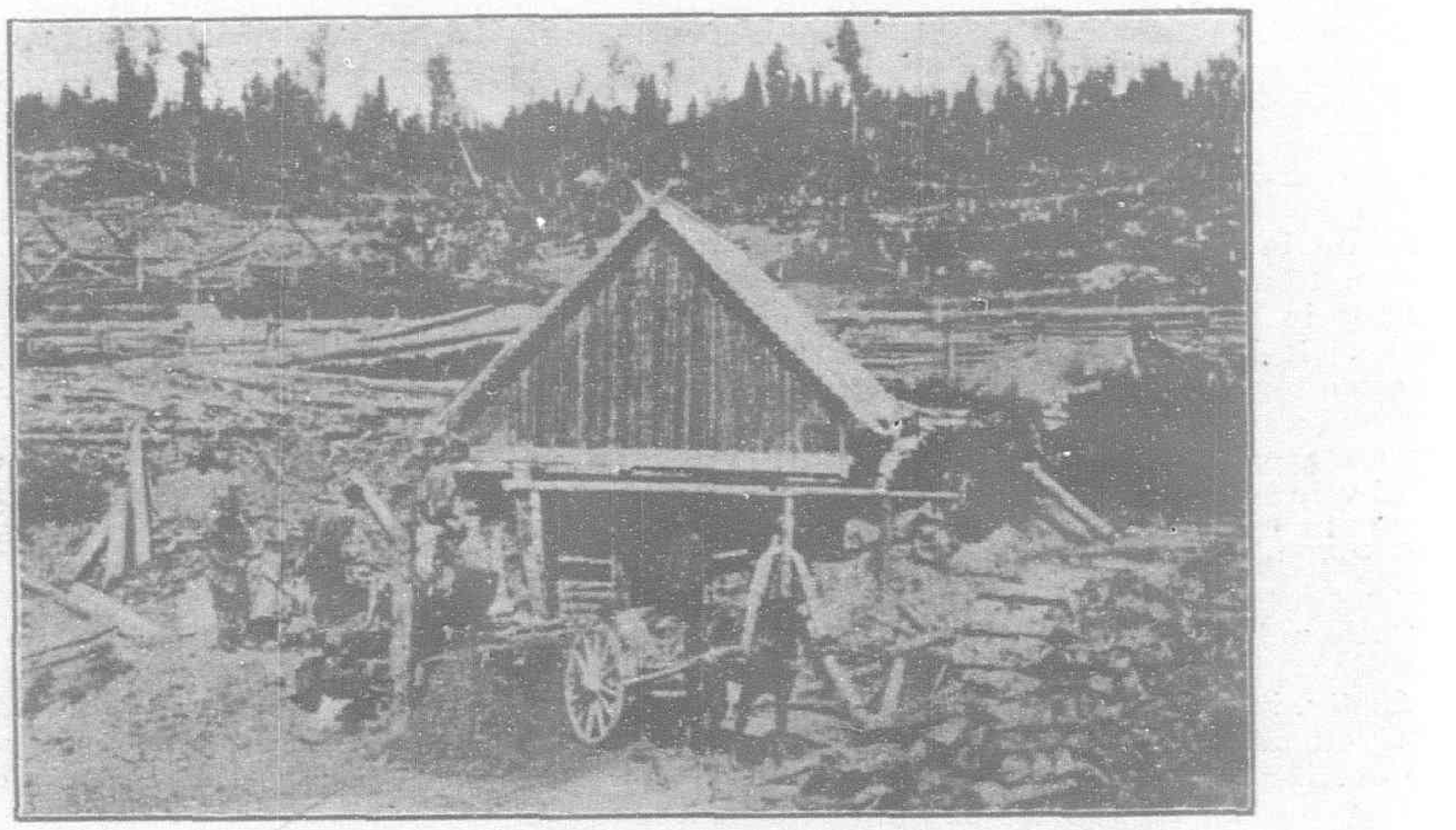


FIG. 2.—LOWER ADIT, CENTRAL MINE, MARIINSK DISTRICT

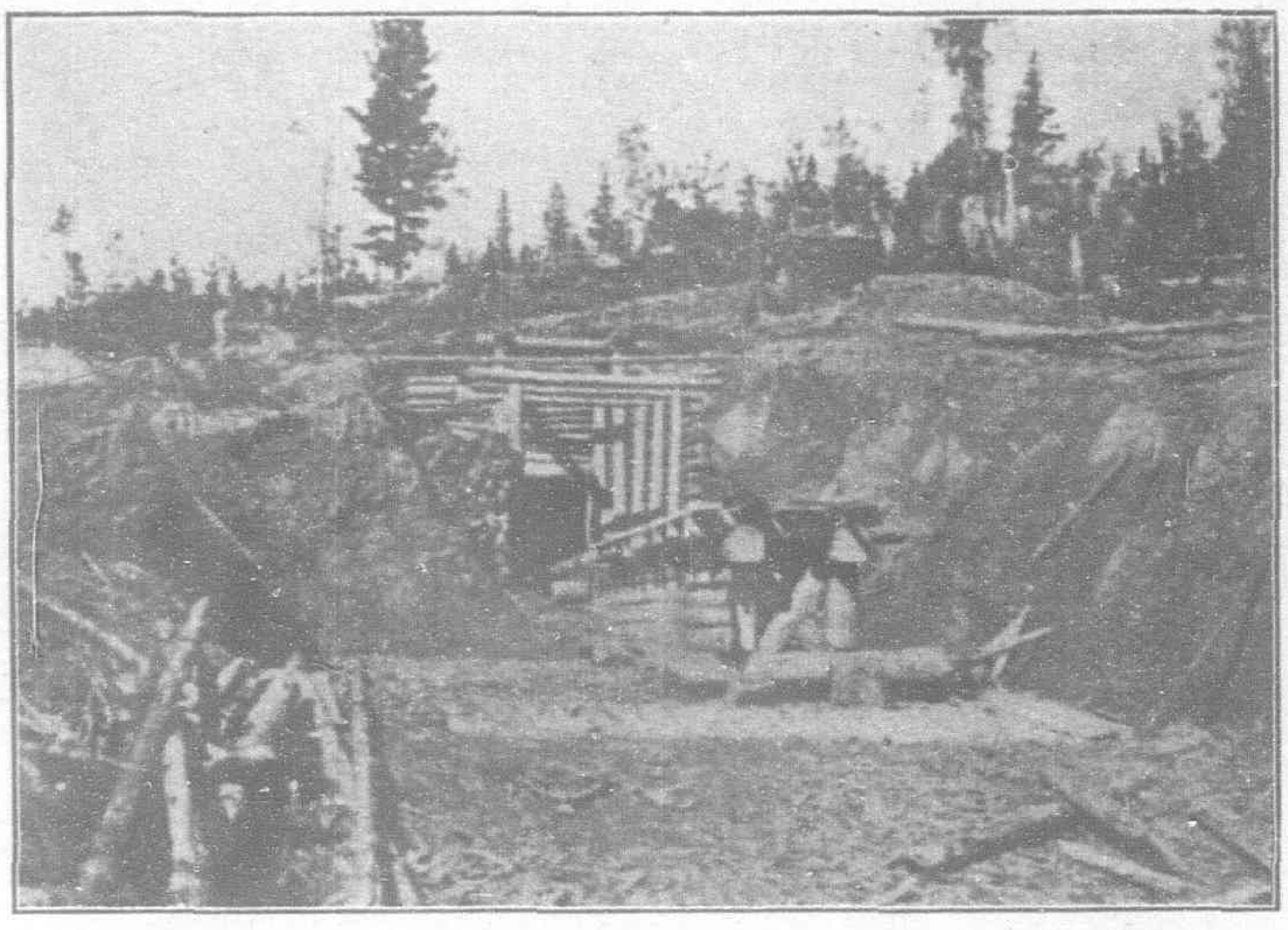


FIG. 3.—UPPER ADIT, CENTRAL MINE, MARIINSK DISTRICT

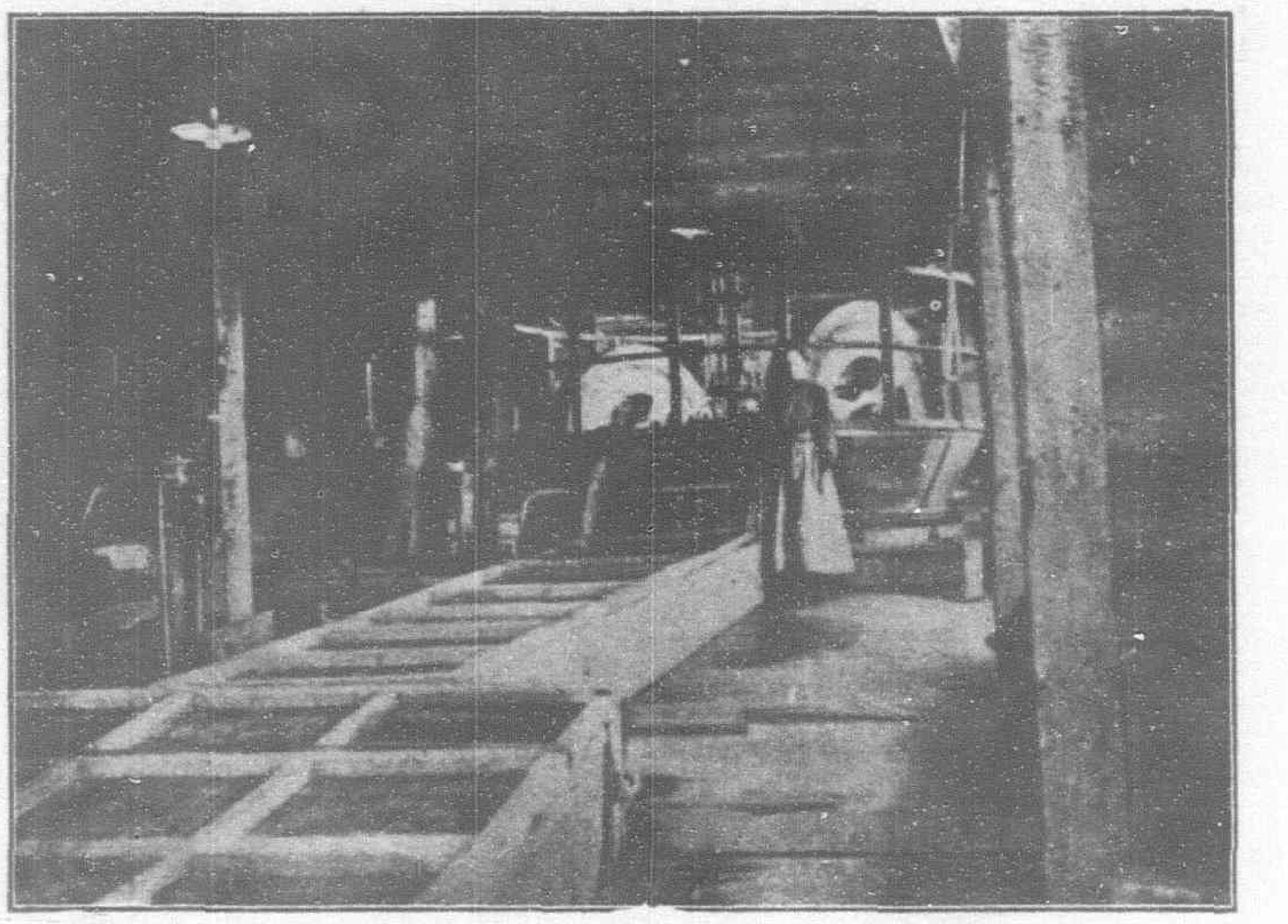


FIG. 4.—CHILEAN MILL, CENTRAL MINE, MARIINSK DISTRICT

veins have come to understand this necessity, and are beginning to fill the stopes with waste rock. Breaking of the rock and ore at present, while the properties are worked from the outcrops, does not offer any difficulties as these are in most cases considerably weathered. In several of the properties, however, where the quartz and diorite are fresh and very hard, machine drills are being introduced; in the Sarala Yeis District, L. B. Brown has introduced three Ingersoll drills worked from an Ingersoll compressor. Mr. Ivanitzki has put up an Ingersoll compressor and ten drills at Bogom Darovanni Mine in the Achinsk District. In the Mariinsk District the Sixth Berikal mine is worked with electric drills of the Thomson-Houston type. As none of these machines is expensive, there is every reason to expect that their universal adoption is a question of only a few years.

The securing of explosives, during the war, was difficult, mainly owing to irregularity of traffic on the Siberian Railway. Even at that time, however, it was possible to get explosives from the Urals by steamer along the river Ob to Tomsk, and thence to the mines in autumn or winter by sledges. With a certificate of the mining inspector, an order for a carload of dynamite, by the Siberian Railway, could be obtained, even in time of war, without much trouble. The prices for explosives in the Tomsk and Achinsk districts are not much higher than in the Urals, especially when quantities of 5 tons and more are supplied at once. Recent prices paid for a similar quantity were: For 86 per cent. dynamite, 35 roubles per pood (50c. per lb.); for 93 per cent., 38 roubles per pood (54c. per lb.); percussion caps with 1 gr. mercury fulminate, 25 roubles (about $1.25) per hundred; 25 ft. of waterproof fuse, 60 copecks (about 30c.).

In order to have a regular supply of explosives near the center of the mining area, arrangements are to be made to keep a storage magazine with about 30,000 kg. of Nobel dynamite in the Achinsk district. Explosives regulation is temporarily in a difficult phase owing to the internal revolutionary activity, but, as the ministry of finance is doing all in its power to increase the output of gold, there is every reason to believe that gold miners will be favored; even now, if a firm can show that it requires dynamite for lawful use in exploitation, or even in prospecting, no difficulty is experienced in obtaining the necessary permits from the mining inspection.

The broken ore is usually trammed down the adits in wooden mining cars, sometimes home-made, sometimes foreign. The Arthur Koppel type is much in favor. Surface haulage is very imperfect; it is done in *tarataikas*—one-horse carts on two wheels—as can be seen in the illustration of the lower adit of the Central Mine, *Fig.* 2, in the Mariinsk District. In winter the *tarataikas* are replaced by wooden boxes on sledges, but snow storms make the haulage sometimes very difficult. To obviate this difficulty, at one mine in the Sarala District, Achinsk, a covered incline for mine cars extends from the mine to the foot of the hill where the mill is situated. K. T. Ivanitzki is putting up a wire-rope aerial tramway of the Bleichert type for a distance of a little over three miles at his Bogom Darovanni Mine in the Achinsk District; the machinery is already at the mine.

The milling of ores is the least elaborate part of the operation, as, with one exception—the Sixth Berikal Mine—the tailings are not treated. The older and richer mines, however, hope to start cyanide and chlorination plants in the near future, as the heaps of sands accumulate fast and, with deeper sinking, the quantity of pyrites increases. Till now, pyrites are concentrated only at the Sixth Berikal Mine, where Stein-Bilharz tables are used for this purpose.

The crushing is done by mills of two different types—the Krupp stamp-mill, and the Urals edge runners (something like the Chilean mill); lately the Chilean mills have been sometimes supplied also by Fried. Krupp Gruson Werk, Magdeburg-Buckau, represented in Tomsk by the technical and industrial bureau. Some of the miners have recently been getting machinery direct from Krupp.

Some data about typical Siberian mills may be of interest. In the Mariinsk District the largest mine has four Chilean mills, one of which is represented in *Fig.* 4, the mill house in *Fig.* 5. The weight of each roller is about 4 tons; with 12 r.p.m. the duty of one mill with two rollers per day of about 20 hours is from 12 to 14 tons of moderately hard quartz and beresite; the screens have 400 apertures to the square inch. The plant is run by a

(Continued on page 226.)

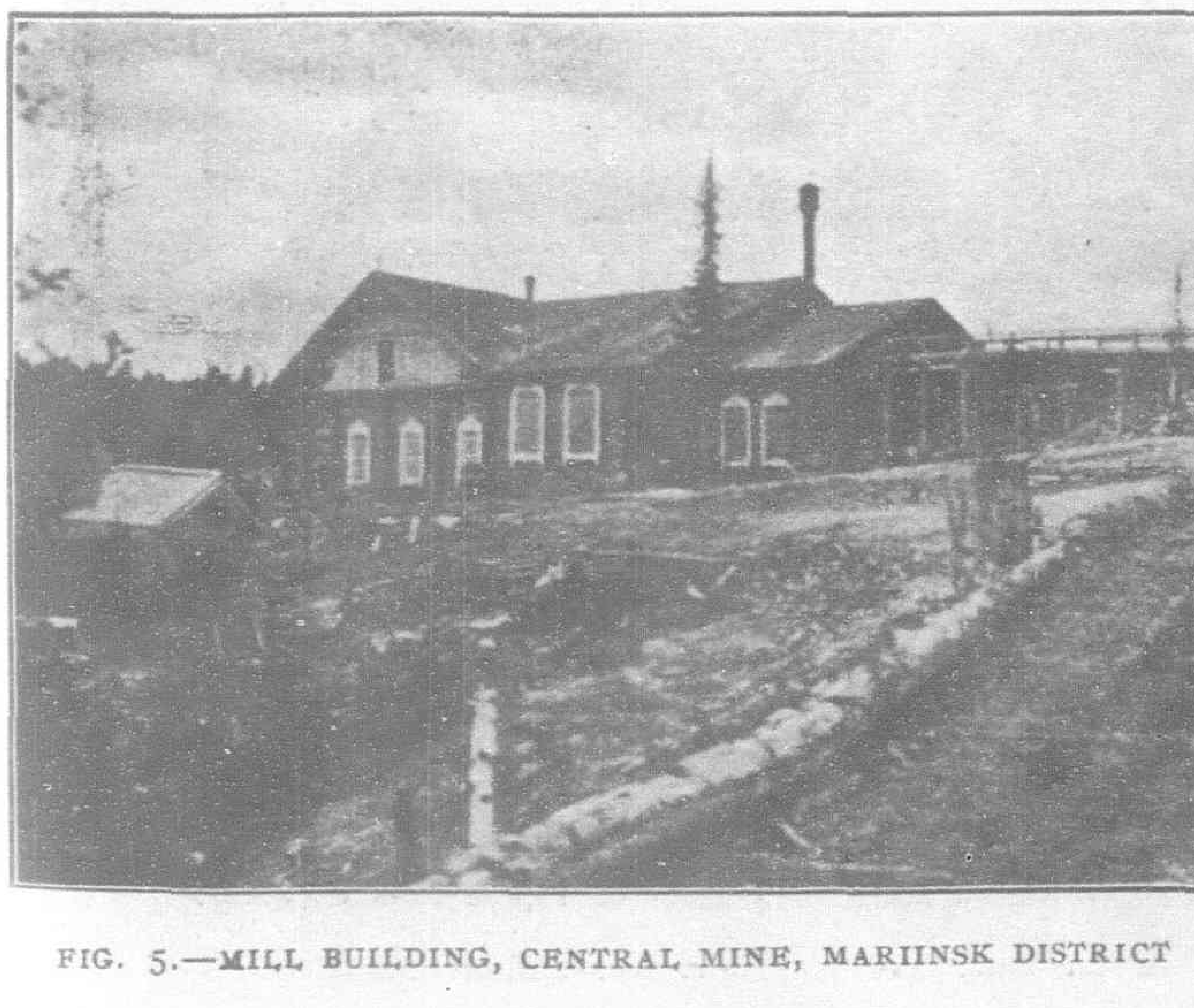


FIG. 5.—MILL BUILDING, CENTRAL MINE, MARIINSK DISTRICT

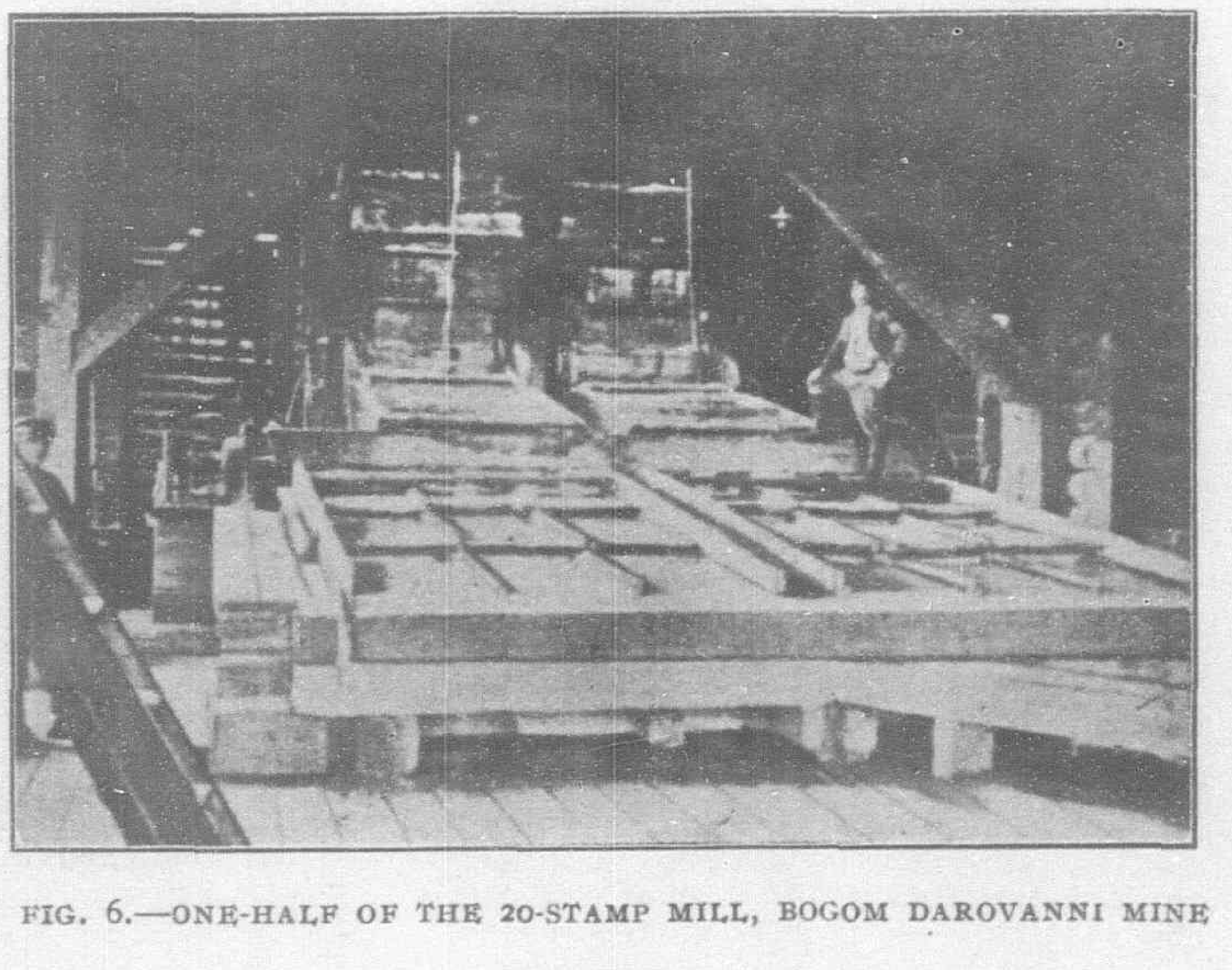
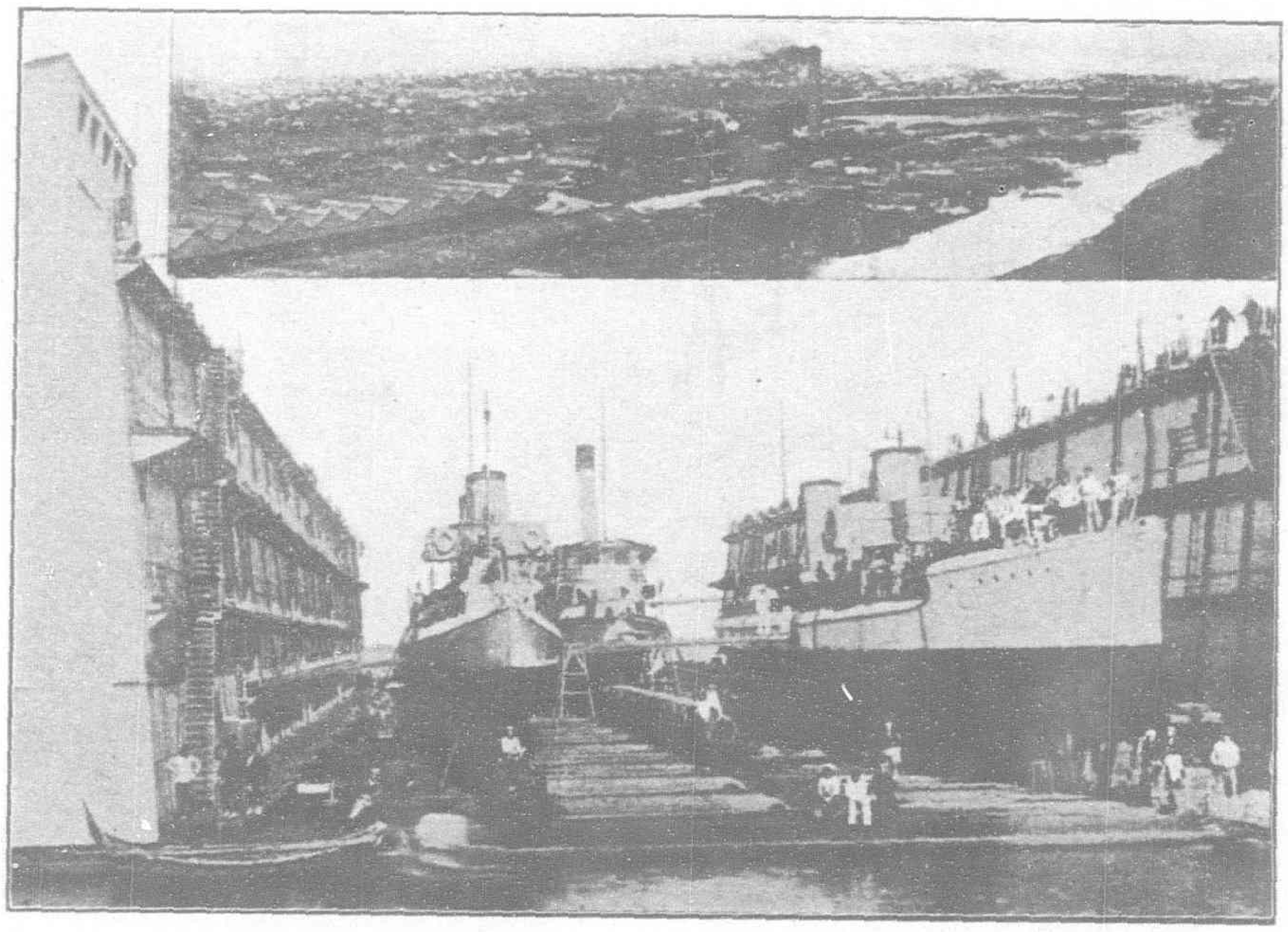


FIG. 6.—ONE-HALF OF THE 20-STAMP MILL, BOGOM DAROVANNI MINE

Model German Settlement of Tsingtau, Shantung Province, China

John Edward Jones, American Consul at Dalny, Manchuria, makes an interesting report in regard to the City of Tsingtau, which is under German control, as follows:—



VICEROY'S ARSENAL AT HANYANG; FLOATING DOCK IN THE HARBOR OF TSINGTAU

Tsingtau boasts a number of hotels where one may find suitable quarters with good food from $50 to $75 gold per month. There is a fine beach hotel located at the bathing beach where many of the visitors from neighboring ports go during the heated term. Germany maintains a garrison at Tsingtau, and many of the surrounding hills are fortified. Long-distance gun practice takes place every day. And there is yet another feature that is to be most heartily commended. The authorities have been conducting a department of forestry since their occupation, with the result that the barren hills of a few years ago are now covered with young forests. Millions of young trees have been set out, and the work has been taken up by the Chinese, who are planting trees themselves under the supervision of the German authorities.

Just outside the city the Germans have built a village for the Chinese. It is a model of its kind, with broad streets and small but well-constructed brick houses. There are regulations in force over there which require the city to be kept clean, and they are obeyed. The Chinese have plenty of breathing space and there is no crowding, with the attendant evils of bad sanitation. A fine market space is set aside, and here the farmers come every day to display and sell their wares.

The health of the city is always good. Strict hygienic methods are enforced by the naval Governor of the city. The city is surrounded with beautiful drives, and everything bears evidence of the strictest care. Recently the Germans have opened a European school, and Europeans for many miles around take advantage of the excellent course and training and send their children to Tsingtau.

There is a model abattoir at Tsingtau, presided over by a competent veterinarian, who examines all cattle brought in for slaughter. The abattoir is much larger than the present requirements of the community and is fitted with all modern appliances. The most scrupulous cleanliness prevails. A model truck farm and dairy also add to the comfort of the people.

BUSINESS IS FLOURISHING.—Quite a flourishing business is being done at Tsingtau. The country is so new commercially that her exports up to this time are not very large; but she is growing every year, as is attested by some figures furnished by the Government.

The imports have increased from $10,900,000 gold in 1904 to $16,200,000 gold in 1905, while the direct exports to foreign countries approximated during 1905 $3,000,000 gold, nearly trebling the amount exported for 1904. The general increase in exports was the feature of the year, which heretofore has been a weak point in the trade of the port. Among these, two staples appeared for the first time in quantities—coal and bean cake. These give great promise of future development. Another and perhaps most important, since the business has been done directly with the United States, is the exportation of straw braid. This staple has, with the assistance of the railway, been diverted from other ports in China. The total exports for the year have been 41,417 piculs (about 5,508,461 lbs.). In 1903 it was 9,696 piculs (about 1,189,568 lbs.), while in 1904 it aggregated 25,383 piculs (about 3,375,939 lbs.). Tsingtau has now become the principal market for straw braid, and the trade of Tsingtau and Chefoo has suffered accordingly. The railway has been largely responsible for this. It reaches the very best territory for this material and what with its excellent harbor offers exceptional advantages not shared by other ports.

A mint for the coinage of copper 10 cash pieces has been opened by the Shangtung Government, and much of the copper used for this purpose is imported from Japan in ingots. For 1905, 15,000 piculs (about 1,995,000 lbs.) were imported.

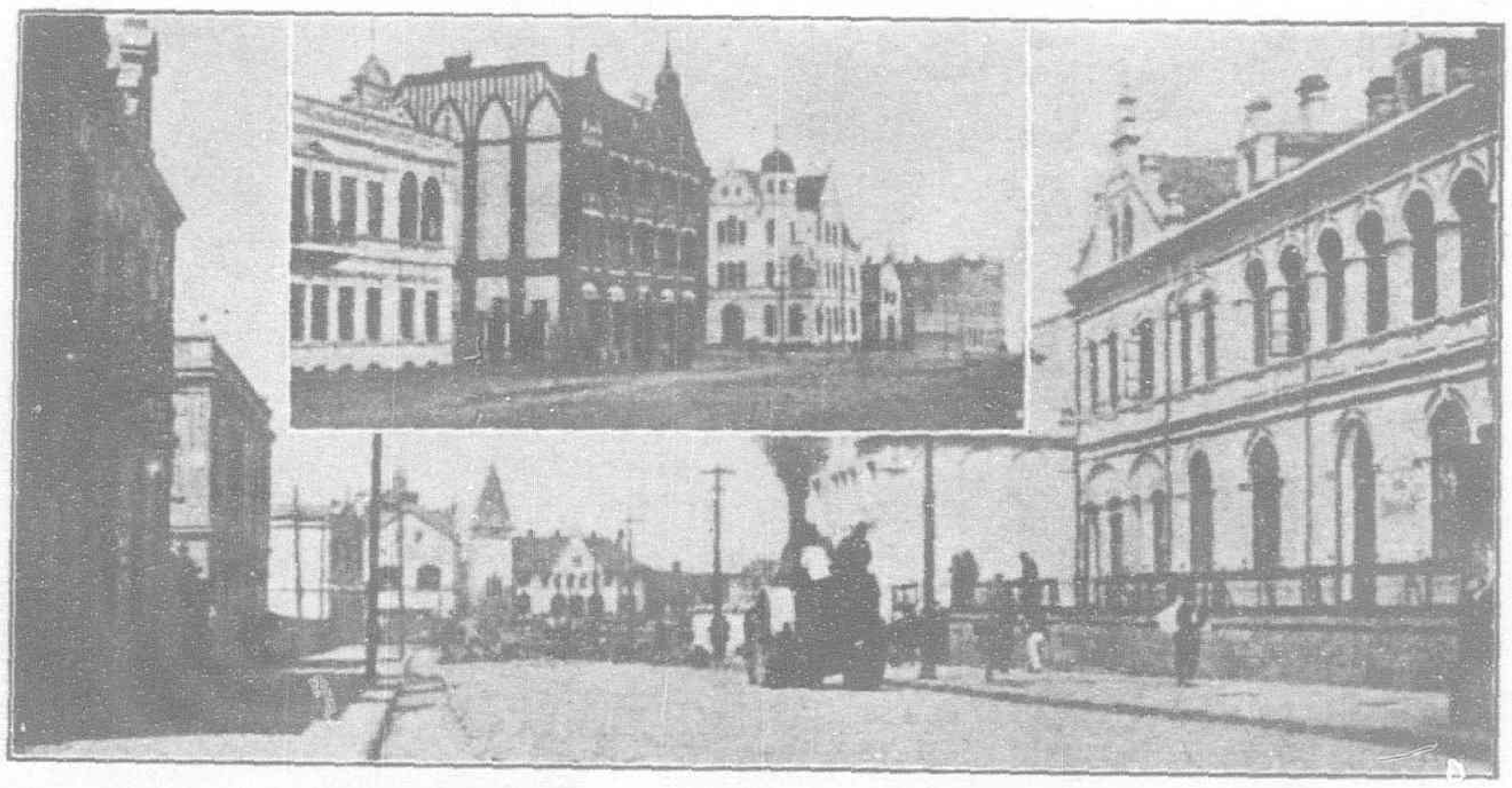
During 1905 there was a brewery established, which is exporting its product to various ports, a soap manufactory and a tannery.

"FREE AREA" RESTRICTED.—The German Government has recently decided to restrict to the harbor the "free area" which hitherto comprised the whole of the German territory and, therefore, necessitated frontier and railway control by the customs. The additional customs convention concluded on December 1st, 1905, is now in force. Customs control of the railway traffic outside of the free-port territory and of the frontier has ceased. Merchandise leaving the free-port territory pays import duty according to the general tariff and is then free to go anywhere into the country without restriction. The German Government reserves 10 per cent of the duties as a contribution to the expenses of the territory, the amount being subject to revision every five years.

A total of 400 steamers and 6 sailing vessels, aggregating 422,673 tons, entered the port of Tsingtau during the year. Of these, 327 steamers and 6 sailing vessels arrived with cargo and 73 steamers came with ballast. During the year 399 steamers and 6 sailing vessels cleared, of which 315 steamers left with cargo and 84 steamers and 6 sailing vessels in ballast. As compared with the previous year this shows an increase of 55 vessels of 37,616 tons. During the year 1,238 foreigners and 3,988 native passengers arrived, and 1,206 foreigners and 4,253 natives departed. By rail there were 123,393 arrivals and 135,176 departures.

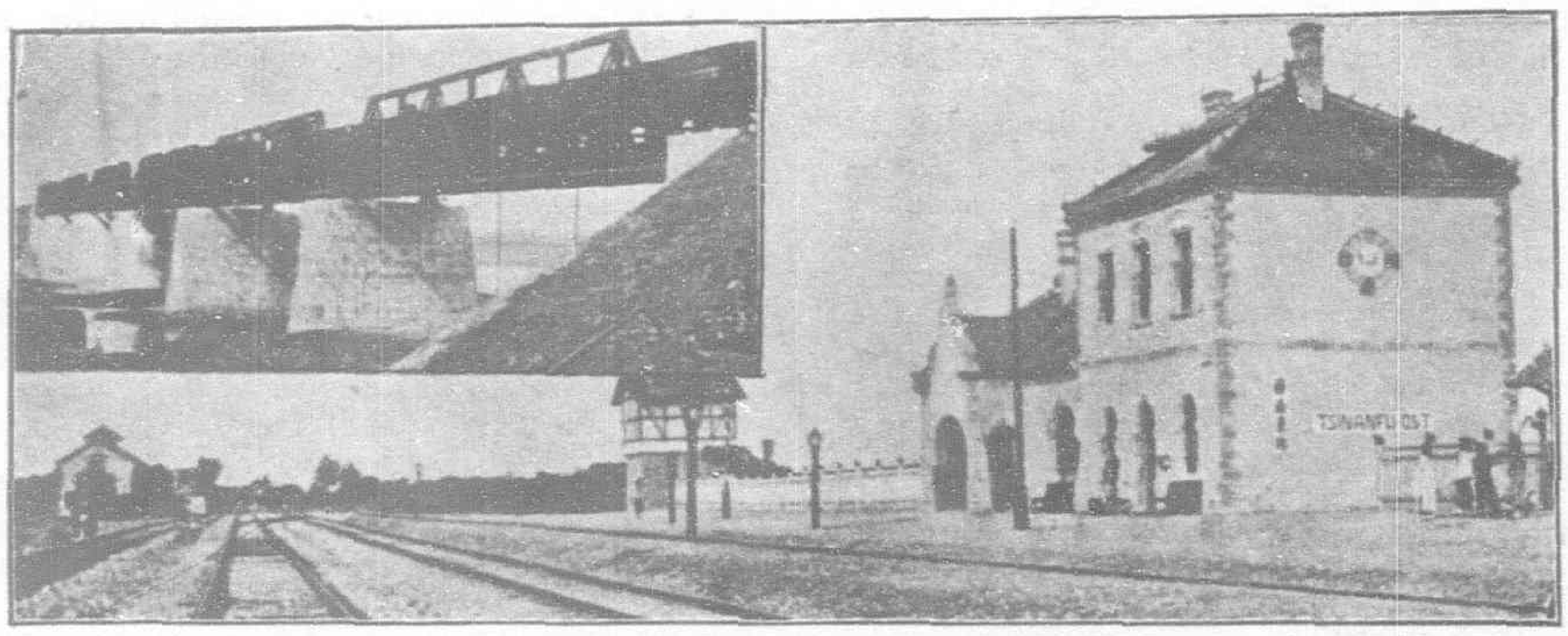
MISCELLANEOUS ENTERPRISES.—The Shantung Railway did a prosperous business during the year, having conveyed 30,300 tons of goods and 795,000 passengers, which is an increase of 65 per cent in point of freight and 42.5 per cent larger in passenger traffic than the preceding year.

The Shantung Mining Company is also progressing, raising 134,000 tons of coal during the year. The opening of the "Annie Pit" during the year greatly increased the production. There are 2,000 Chinese employed at the main diggings, and their pay averages from 200 to 400 "cash" per day (20 to 40 cents gold). They work in shifts of eight hours.



BUSINESS BLOCK AND A STREET-IMPROVEMENT SCENE AT TSINGTAU

The floating dock is capable of taking in vessels of 16,000 tons capacity. During the year 1905 the dock took in and repaired eight war and merchant vessels of a combin-



BRIDGE ON THE SHANTUNG RAILROAD, BUILT UNDER GERMAN CONCESSION, ABOUT 35 MILES FROM TSINGTAU; A TYPICAL WAY-STATION ON THE LINE

ed tonnage of 14,644 tons. The dock is fitted with the most modern appliances for lighting with an electrical supply operated from a central station, so that work may be carried on during the night. A steam plant is also provided that vessels in the dock may be heated during the winter. The workshops are fitted for all kinds of work, and two cranes of 20 tons capacity each are available. The docking rates differ according to the size of the vessel, from 40 cents Mexican (about 20 cents gold) per ton for a 500 ton vessel to 20 cents Mexican (10 cents gold) per ton for a vessel of 6,000 tons up.

The silk industrial establishment, which gives practical experience to the graduates of the sericulture schools, is in full operation, and its products find a ready sale. At present it employs about 650 hands. The majority of the laborers have had training in the sericulture schools and execute very good work. The exportation of silk during the year 1905 was a disappointment. This was due in large measure to the low prices prevailing in Shanghai, and much of the silk which otherwise would have come to Tsingtau was sent by junk to Peking and Manchuria.

The Germans are looking forward with great expectations to the results from the two new silk schools established in Tsingchow and Changihisen, which are reported to be doing well and turning out a considerable number of skilled hands whose work will tell in the immediate future. Quite a business is done in peanut oil, although the yield for 1905 was not generally bought, and a considerable amount still remains on hand.

QUEENSLAND SUGAR INDUSTRY AND LABOR

Queensland sugar planters are much concerned about the labor question on account of the expressed determination of the Federal Government to enforce the prohibition of the employment of colored labor after the close of 1906. In the southern or less tropical portions, the industry would not be affected, as it is here that white labor has proved a success. The position is that after four years operation of the white labor bonus of £2 per ton sugar, only one-third of the sugar crop has been grown by it. Dr. Maxwell, the Queensland Director of Agriculture, considers that the position of the industry after 1907 will be most serious. The place of the deported Kanakas will be taken by *other aliens, who are, and must remain,* outside the conditions of white production, and in time produce "a grave menace to imperial concerns." In New South Wales there is no colored labor difficulty, although a few Asiatics are employed. Here the cane is cut every second year, while in Queensland a crop is annually obtained for the greater portion of the cane growing area. The average price for standing cane in New South Wales is 11*s.* 3*d.* per ton, and the cost of cutting, transport, etc., brings it to 16*s.* 6*d.* The total acreage in canes has diminished from 32,907 acres in 1894-95 to 21,525 acres in 1904-05. In Queensland, the sugar industry has increased from 69,983 tons in 1890-91 to 147,688 tons in 1904-05. In addition to the 53 mills crushing cane, two refineries and four juice mills, representing a capital of £2,120,459, were employed. After December 31st, 1906, any Pacific Islander found in Queensland will be deported.—*Indian Planters Gazette.*

TRADE CATALOGS AND CHINESE

Experience is teaching the foreign exporters that it is a waste of money to send trade catalogs to China in English. Manufacturers will not buy in that way. It is the man on the ground who gets the business. The Chinese are a suspicious people and must see the goods. Germany now has many men busy laying the foundations for future trade, and the Japanese, as well as the British, are very active. Even South American firms have representatives in the field. To establish business in China you must have at least one good man on the ground and must not be in too great a hurry for returns. In the end China is bound to become a vast field for the exploitation of foreign machinery and tools and goods of all kinds. Those concerns whose long and patient missionary work has obtained the confidence of the natives will be the first to profit when the time is ripe for the actual selling. And in large measure what is true in this regard with reference to the Chinese holds equally good with most all other orientals. The Japanese are, to some degree, the single exception. The Japanese have by years of progression learned the merits and demerits of foreign materials and goods, so when the trade catalog comes to them in the usual way they know what to do with it. It will require years of hard missionary work, however, to educate the Chinese and other orientals up to the full benefits and usefulness of the trade catalog in the expedition of business.

RAILWAYS AND TRAMWAYS, NEW SOUTH WALES

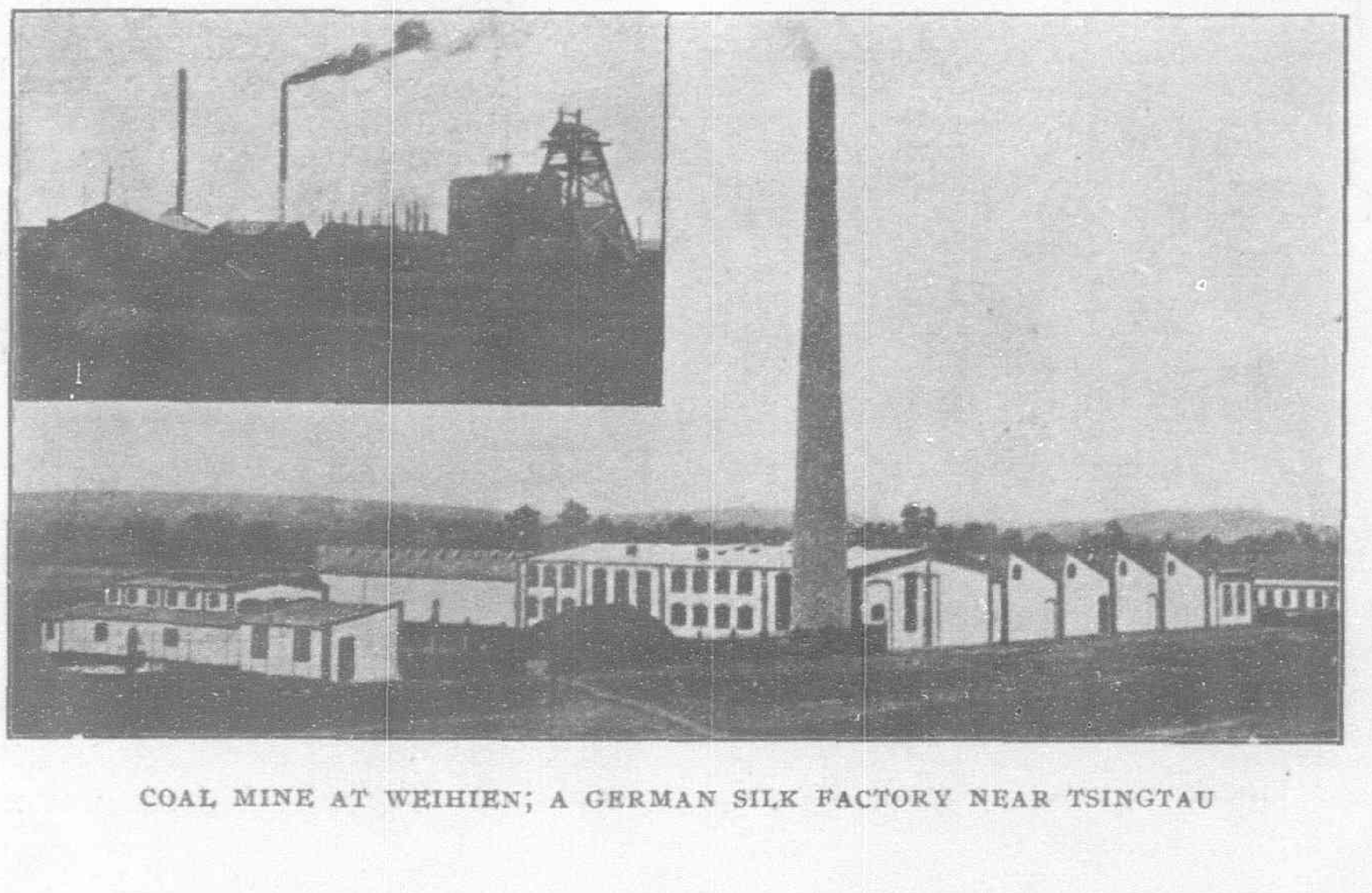
Some of the more important details of the transportation movement in New South Wales, Australasia, during the fiscal year ended June 30th, 1906, are herewith quoted from an American consular report, the amounts being stated in gold:—

The earnings from the two services (railways and tramways) totaled $24,752,352 and the expenditure $14,470,377, leaving a balance of $10,281,975. The interest on capital invested totaled $8,136,140, which, deducted from the net earnings, leaves a surplus of $2,145,835, to which the railways contributed $1,873,505 and the tramways $272,330. In 1904–5 there was a total deficiency of $178,590, so the figures for 1905–6 show an improvement of $2,324,425. The percentage of working expenses to revenue was reduced from 59.5 to 54.51, being an improvement of 4.99.

On June 30th last there were 3,390 miles of railway open for traffic, and the capital expended was $212,306,335, the average cost per mile, including workshops and rolling stock being $62,647. The percentage of profit to capital invested was $21.53, as compared with $16.84 for the previous year, and $13.87 for 1888, the first year after commissioners were appointed. The return per average mile open last financial year was $2,783, after deducting working expenses from earnings. The earnings per train mile were $1.74, the working expenses $0.94, the net returns being $0.80. During the year 37,500,531 passengers were carried, the goods totaled 7,400,658 tons, and the live stock 228,834 tons, while the mileage run totaled 11,863,682 miles.

During the year 4,564,668 tons of coal and shale were carried an average distance of 20.15 miles per ton, the earnings per ton being $0.01. The grain and flour carried tolaled 502,206 tons, the average miles per ton being 245.18, and the earnings per ton mile were $0.0088. The average earnings per ton mile of other classes of freight were: Wool, 4 cents; general merchandise, 3 cents; live stock 3½ cents; firewood, 1½ cents, and hay, straw, and chaff ¾ cent.

The number of miles of tramways open on June 30th was 126, and the average cost per mile, including workshops and rolling stock, was $141,576. The percentage of profit to capital invested was $24.71, as compared with $17.11 in the previous year and $9.63 in 1888. The percentage of working expenses to earnings was 78.11, being a reduction of nearly 6 per cent. The return per average mile open, after paying working expenses $7 197, the earnings per tram mile $0.25, the working expenses $0.19, leaving a return of $0.05. The number of passengers carried was 145,262,779 and the mileage run 16,309,907. The staff employed on the railways on June 30 last was 13,478, and on the tramways 4,163.

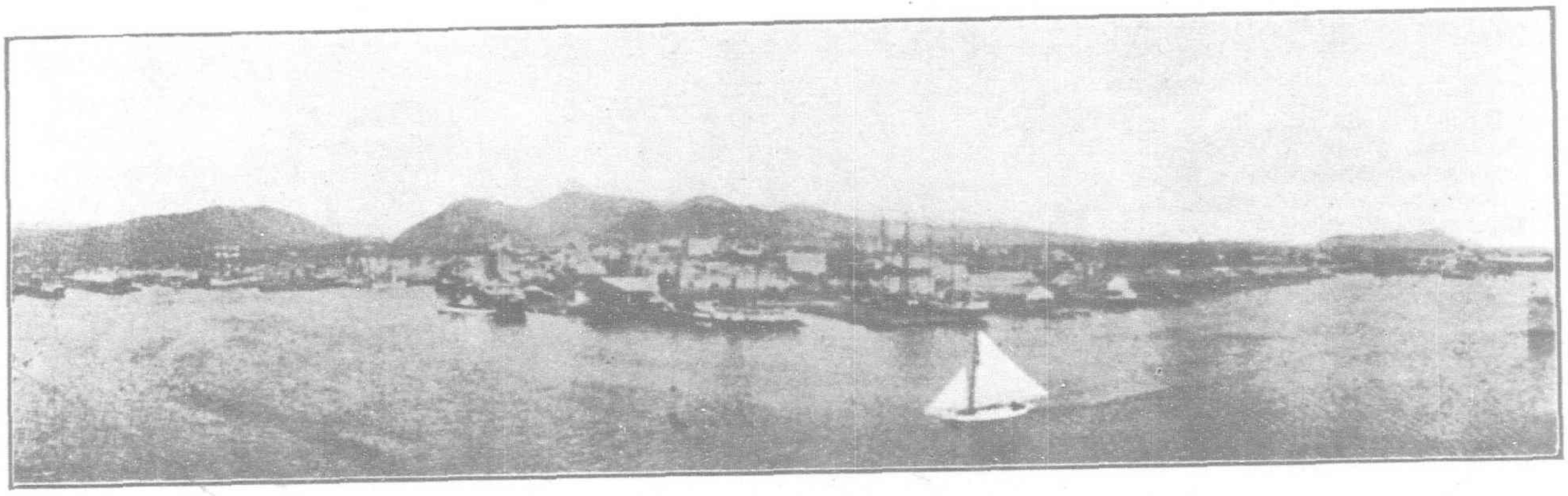


COAL MINE AT WEIHIEN; A GERMAN SILK FACTORY NEAR TSINGTAU

Island of Hawaii, Center of Transpacific Commercial Traffic

Mr. W. A. Graham Clark, special agent of the Department of Commerce and Labor at Washington, for the investigation of the cotton-goods trade in China, while *en route* thither was detained at Honolulu by a steamship wreck, and made use of his time in studying the commercial features of the Hawaiian Islands. His report, which follows, discusses questions of the hour relating to the foreign trade of the islands and their economic development, which, for many reasons, are of general interest on this side of the Pacific. Mr. Clark says:—

Hawaii, the "Crossroads of the Pacific," is a central point for the great ships that tread their way back and forth across the Pacific carrying the interchange of the muscle with the brain products of the world. Politically, commercially, and strategically it is important to the United States, and its importance will be vastly increased with the opening of the Panama Canal. As westward the tide of empire takes its way and our western shores are peopled and the Orient arouses to its strength, it is probable that it will be but a few years before the tide of the world's greatest commerce will flow through its ports. Situated in a direct line between Panama and Japan, between Sydney and Seattle, the nearest route between San Francisco and the Philippines, and touched by the majority of the great liners plying between the Occident and the Orient, its importance will grow with the expansion of trade. The Hawaiian Territory is composed of eight principal islands, with a population according to census of 1900 of 154,000. That was six years ago and there is no official census available since, but it is estimated that the present population is about 165,000, divided, approximately, into 30,000 natives and 7,000 Kanakas, 65,000 Japanese, 40,000 Chinese, 8,000 Koreans, 7,000 Portuguese, and 8,000 whites. This is about 8 white people to 157 Asiatics, Portuguese, and native Hawaiians. That the above slight increase of population is correct is shown by the fact that while the Japanese numbered 61,115 in 1900 and 38,479 have since been admitted, an unofficial census in April by Editor Shiozawa, which is believed to be approximately correct, makes the present Japanese population less than 65,000.



VIEW OF HONOLULU, GREAT TRANSPACIFIC PORT OF CALL

At present Hawaii Territory is distinctively a one-crop agricultural country. Sugar, protected by the tariff, has become the one great product and forms 95 per cent of the total value of the exports from the islands. Of the total exports of $26,993,824 gold in 1906, $25,495,427, or 94.4 per cent, was sugar; and of the total of $36,318,768 in 1905, $35,112,127, or 96.7 per cent, was sugar. Relying on one product the prosperity of the islands, to a considerable extent, rises or falls with the price of sugar.

LARGE SUGAR YIELD.—Sugar being the money crop of the islands, the cane is cultivated on a large scale and is a very important industry, covering about 200,000 acres. In the use of improved methods in this industry and in yield of cane per acre—between 4 and 5 tons—and yield of sugar per ton Hawaii probably leads the world. Steam plows are used in the fields, private steam railways on the plantations carry the cane from the field to the mill, where the latest steam and electrical machinery is used, and then it is shipped on the plantation railway to the plantation wharf to be carried to Honolulu or Hilo for shipment east. Vast irrigation works and costly pumping stations have been installed. Some of the mills cost over $1,000,000 each, and the companies, of which there are over 60 in the islands, are capitalized at from a few thousands to 5,000,000. The quantity and value of the sugar exported for the last 10 years is as follows:—

Year.		*Pounds.*	*Value.*	*Price per pound. Cents*
1897		431,196,980	$13,164,379	3.05
1898		499,766,798	16,660,109	3 33
1899		462,299,880	17,287,683	3.72
1900		504,713,105	20,392,150	4.05
1901		690 877,934	27,093,863	3.92
1002		720.553,357	24,147,884	3.35
1903		774,825,420	25,665,733	3.31
1904		736,496,992	24,359,385	3.30
1905	raw	811,603,329	33,946,040	4.19
	refined	21,118,308	1,166,108	5.52
1906	raw	712,560,997	23,840,803	3.35
	refined	34,041,640	1,654,624	4 86

DEVELOPMENT OF OTHER INDUSTRIES.—The Territory needs diversification of industries, and concerted efforts are being made to this end. The shipment of pineapples and of bananas has developed into quite an industry, and efforts are being made to push the sale of the alligator pear, mangoes, and other tropical fruit. First-class coffee is raised and with favorable markets would develop rapidly. Tobacco is being tried and has had some success. Sisal is an experiment that promises to prove of great value. Rubber is being tried with favorable prospects, but is too young to secure any marketable results. Forestry work is being judiciously inaugurated, both for soil protection and for its wood value. One tree, the *koa*, is a fine, close-grained wood resembling mahogany and is very valuable. In raising fruits and other products as above there has been considerable enterprise shown, but they do not as yet figure much in commercial statistics because practically all are consumed in the islands.

LACK OF LABOR.—In the sugar-cane cultivation one of the greatest difficulties from the beginning has been that of sufficient labor, and 25 years ago the planters organized mainly for this purpose under the name of the Planters' Labor and Supply Company. More labor is to-day one of the crying needs of the Territory.

The average laborer of the plantation gets about $21 gold a month, whereas in railroad construction and other work on the Pacific Coast he can make $1.75 a day and up, which results in Hawaii, as one of the leading men here puts it, "being at present little more than a sieve through which the immigrants are strained, the usual result following, that the strongest and most energetic go, leaving behind the least efficient or those who have individually established themselves in business."

Since annexation, under our alien-labor laws, individuals and associations can not import contract labor, so most of the immigration, consisting principally of Japanese, is voluntary and largely transient. It has been construed, however, that this law does not apply to the territorial Government, and so the work is now carried on by them. One of the latest experiments was the importation of a couple of hundred of the sect of Russians known as Molokans, but it proved a failure. The Portuguese, while having a tendency to drift away from the plantations and build up small homes and truck farms of their own, are among the steadiest and most industrious of the immigrants so far secured, and the Territory now has an agent in the Azores trying to induce further immigration of this class.

The Japanese make good laborers and are apt and intelligent, but are, as a rule, ambitious and restless and rather given to strikes. They tend to drift into the higher classes of labor about the plantation and leave in large numbers for the more remunerative work on the coast.

CHINESE LABOR MOST DESIRABLE.—The plantation owners are strongly in favor of Chinese as furnishing the labor best suited for work in the cane and rice fields, because of his similar native environments. He makes a steady, law-abiding, efficient plantation laborer and is content to work for small wages. As there is no American labor, practically, in the sugar-cane and rice fields to be affected by their competition and they can be readily imported and furnish the labor best fitted for the climate and the work, these facts are being strongly urged by plantation owners and others as reasons for a future modification of our Chinese exclusion act. Some modification allowing the importation of a definite number for a definite term of years would undoubtedly develop the islands wonderfully, as labor is its great need. On the other hand, those not directly interested in the plantations oppose importing Chinese, as tending to increase the population of un-American elements. Both on account of the climate and the contact with the Asiatic and native labor, very few whites are to be found in the fields.

Efforts are being made to retain a larger proportion of the Japanese and other immigrants that at present make only a temporary stay here. One cause of this unrest is the large plantation system where all the land for miles around is owned by one corporation. This does not give much chance for real home life or for improvement on the part of the individual laborer. The best plan to secure and retain a supply of steady, satisfied labor would be for the plantations to give or sell land to tenants for homesteads. Land can not be moved, and a family owning a homestead on which they have possibly made improvements is vastly less likely to remove than in the usual case where they are simply tenants at will. Some form of profit sharing would also have a strong tendency to promote more interest in their work and to retain a better class of labor.

Of the sixteen regular through liners there are five that make regular runs to San Francisco that can not be used for Hawaiian freight or passengers, owing to the operation of our coasting laws forbidding shipment between American ports except in American bottoms. This has in some cases, as instanced especially in fruit shipments and in cases of business men in a hurry, affected adversely the business interests of the islands, and has been commented on in published reports by the governor, by the chamber of commerce, and by business organizations. The minimum penalty is $200, and cases are noted where men have paid their fine in advance and taken these boats under pressure of necessity. When the coasting law was passed the United States had no noncontiguous territory, and so the law was not formed for such a case. It would help the business interests of the Territory to make noncontiguous territory an exception to this rule, or else reduce the fine to $25 or $50.

Besides the five big through steamship lines the American-Hawaiian Steamship Company operates seven big freighters between Hawaii and New York, *via* the Horn, and two between Hawaii and Pacific ports, San Francisco, Seattle and Tacoma. They handle the bulk of the sugar trade which is shipped partly to San Francisco refineries, partly overland to New York, and partly around the Horn to New York. Around the Horn is cheapest, and the larger part of the sugar goes this route, but it takes from two to four months. This line is now making arrangements to divide its fleet between the Atlantic and Pacific and ship to Salina Cruz in Tehuantepec Bay, then over the Mexican National Railroad to Coatzacoalcos, and thence again by ship to New York. This involves breaking cargo, but the company will guarantee delivery in 32 days, and the rate will also be slightly reduced. This will further stimulate the sugar industry, one of the main drawbacks of which has been the delay in reaching New York.

EXPORTS AND IMPORTS.—The commerce of Hawaii for year ending June 30th, 1906, as compared with 1905, shows a falling off in value of about one-fifth, or in round numbers $10,000,000 gold. This is a discouraging showing, but in some respects, on closer analysis and remembering that permanent commercial prosperity of the islands depends on diversification of industries, there are a good many redeeming features. Studying the exports of domestic merchandise to the mainland, the exports to foreign countries being negligible, we find that the decrease was $9,208,646. The decrease in sugar alone, owing both to a small crop and to the low price, was $9,618,274 gold. This shows a gain of $409,728 in the value of shipments of other domestic merchandise, which, considering the efforts that have been put forth, is an encouragement as showing progress along this line. Considering the total exports and imports of the islands, including both merchandise and money, we find:

Export and imports	1905	1906	*Decrease (—)* *Increase (+)*
Total exports......	$36,318,768	$26,993,824	—$9,324,944
Total imports......	14,871,144	15,639,874	+ 768,730
Total trade....	$51,189,912	$42,633,698	—$8,556,214

From above we see that there was in favor of the islands in 1905 the enormous trade balance of $21,447,624 gold, but in 1906 this had dropped to $11,353,950. That the great decrease did not create disaster to the islands was simply due to the fact that the remaining balance was still too largely in their favor. On the other hand, the full effort of the large favorable trade balances are not as largely felt in the development of the islands as they might otherwise be, owing to the fact that much of the large plantation stock is owned by persons residing outside the territory—Germans, British, and Americans—and in favorable years a not inconsiderable portion of the profits is lost to the islands.

DIVISION OF COMMERCE.—Being an American territory and situated as it is, of course the great bulk of the trade is with the mainland. This is shown in gold as follows:—

Exports and imports.	*1905*	1906	*decrease (—)* *increase (+)*
Exports to United States..........	$36,259,207	$26,937,511	—$9,321,696
Imports from United States..........	11,856,180	12,364,632	+ 568,452
Exports to foreign countries.......	59,561	56,313	— 3,248
Imports from foreign countries......	3,014,964	3,275,242	+ 560,278

With regard to Hawaii's principal staple, there was exported to the mainland in 1906 712,560,997 lbs. of raw sugar valued at $23,840,803 gold, against 811,603,329 lbs. valued at $33,946,036 for 1905. This enormous decrease is only partially and in a slight degree compensated for by the fact that the amount of refined sugar increased from 21,118,058 lbs. valued at $1,166,091 in 1905, to 34,041,640 lbs. valued at $1,654,624 in 1906, a gain of $488,533. As sugar refining is a comparatively new industry here, this increase, especially in a year when the total crop decreases, is encouraging to those favoring diversification of industries.

Other shipments of domestic merchandise showing a healthy increase in the comparison of the two years are as follows:—Rice shipments about doubled with a gain of $141,598 gold from 2,771,083 lbs. valued at $81,414 in 1905, to 5,739,500 lbs. valued at $223,012 in 1906. At the same time rice shipments from the mainland dropped $138,166 gold. Raw coffee shipments increased from 1,437,053 lbs. valued at $173,617 gold in 1905, to 2,147,154 lbs. valued at $248,593 in 1906, a gain of $74,976 in value. The shipments of canned fruits increased from $66,876 to $152,582, or a gain of $85,706 gold. Fruits, green, ripe or dried, increased $11,152. Bee products, honey and beeswax, amounted to $133,170, or an increase for the year of $46,450 gold. Hides and skins show an increase of $42,333; leather, $14,591; tallow $7,046, and chemicals, dyes, drugs, and medicines, $7,842. On the whole, the above is encouraging to the advocate of diversified industries.

CUSTOMS REVENUE.—The customs receipts for the year ending June 30th, 1906, were $1,218,764 gold. Last year the receipts were $1,043,340. These receipts of course go to Washington. Before annexation they were used for the islands, and there is quite an agitation being carried on to induce Congress to pass an act under which the Secretary of the Treasury shall cause to be set aside, for a period of 20 years, 75 per cent of the customs and internal revenues from Hawaii, to be used in Hawaii, as may be directed by Congress, for the erection of educational and federal public buildings, and for harbor improvements and federal military and naval defenses.

SUMATRA AND BORNEO TOBACCO

The final results of the autumn sales in Amsterdam have more than justified the expectations formed at the conclusion of the spring and summer sales that 1906 would prove a record year for Sumatra and Borneo tobacco. The average price of c.155, or 2s. 7d., per lb. realized for the Sumatra crop is, with one exception, the highest in the history of the industry. In 1875 it is true that an average of c.170, or 2s. 10., was obtained; but in that year the total crop was only 15,355 bales, while the crop just sold was no less than 225,369 bales. This compares with a crop last year of 233,957 bales, and an average price of c.99, or 1s. 8d., per ℔. The excellent results of 1906 are attributable to more than one cause, and, so far as can be judged, several of the factors which contributed to make the present year such a success from the planters' standpoint are likely to exert a powerful and beneficial influence in 1907.

A noteworthy feature this year has been the purchase of Borneo tobacco for the first time for America, and the product of Sumatra's sister island should have a great future before it in the United States. The crop from Borneo this year is returned at 17,062 bales, which sold at an average price of c.97, or 1s. 7½d, per ℔. This compares with a crop of 16,615 bales in 1905, sold at c.62, or 1s. 0½d., per ℔.

An English company is well to the fore in the list of highest averages. The first honors fall to the Amsterdam Deli Compagnie, whose average is c.217, or 3s. 7d., per ℔. for 10,906 bales; but next comes the United Lankat Plantations, Ltd., with c.209, or 3s. 6d., per ℔. for 9,394 bales. This company's interim report, just out, shows a profit of over 50 per cent for the year. The Great Deli Maatschappij has an average of c. 166, or 2s. 9d., per ℔. for 53,853 bales—a magnificent return for such a huge quantity—which is about 22 per cent of the whole Sumatran crop. The British Deli and Lankat Tobacco Company, in its reconstructed form as the Rimboen Tabak Maatschappij, has made an excellent start with an average of c.135 (2s. 3d.) for 4,867 bales, which compares with c.82 (1s. 4½d.) for 4,442 bales last year. The Serdang Maatschappij (once the Netherland India Sumatra Tobacco Company, Ltd.), obtained c.92 (1s. 6½d.) for 5,345 bales, whilst last year the average was c.85 (1s.5d.) for 4,966 bales.

In Borneo London is as prominent as is Amsterdam in Sumatra. Out of the total crop of 15,062 bales, two companies—the New Darvel Bay (Borneo) Tobacco Plantations, Ltd., and the New London Borneo Company, Ltd.—contributed over 14,100. The former company realized c.116 (1s.11d.) per ℔. for 7,225 bales against c.122 (2s 0½d.) for 3,686 bales in 1905. The very largeness of the crop rendered its handling difficult; but the decline in average has been handsomely compensated by the increase in yield. The gross sum realized this year has been about £90,000, as against about £45,000 last year, when the net profit was £10,000 and the dividend 10 per cent. The New London Borneo Tobacco Company, on the other hand, shows a diminution in crop and an increase in average, the figures being respectively, for 1906, 6,919 bales sold at c.81 (1s. 4d.) per ℔., against 8,668 bales sold at c.40 (8d.) per ℔. last year. This was sold for about £39,000 gross, with a resultant loss of £2,000; while this year's crop has realized about £65,000 gross. The New London and Amsterdam Borneo Tobacco Company obtained c.70 (1s. 2d.) per ℔. for a crop of 1,492 bales, compared with c.44 (9d.) per ℔. for a crop of 2,277 bales in 1905. The cultivation on this estate has been abandoned, it having been acquired by the Langkon North Borneo Rubber, Limited, with the object of cultivating Para rubber, which is understood to be doing well.

The average price per crop of all Sumatra tobacco this year works out at not far short of £20 a bale, and taking the cost of production all round at an average of £10 a bale, the result is a profit of 100 per cent, or, say, £2,250,000. sterling. The average for all Borneo is, roughly, £12 a bale, and the gross product about £204,000. The average cost of production is probably from £6 to £7 a bale; so that a very handsome profit is left. The new campaign, which will open about March, 1907, is now all the talk in Amsterdam, and a most optimistic tone prevails, especially as it is rumored that the Java crop, which competes with lower-class leaf from Sumatra and Borneo, has been damaged by floods.

TREATISE ON TIN-MINING

THE FAR EASTERN REVIEW is in receipt of a very valuable treatise on the tin-mining industry of Malaysia by M. A. Brochier, formerly director of the exploitation of mines and minerals for the Government of Indo-China. Its title is *Gisements D'Etain dans La Péninsule Malaise, Les Indes Néerlandaises et le Haut-Tonkin*, and is profusely illustrated with most practical and helpful plates for those who are interested in the mining methods of that section. THE REVIEW is under obligations to M. Brochier for photographs which it reproduced in the November issue in connection with tin-mining in Malaya. While the photos had no direct bearing on the particular field covered, indirectly they illustrated most satisfactorily general tin-mining methods throughout Malaya.

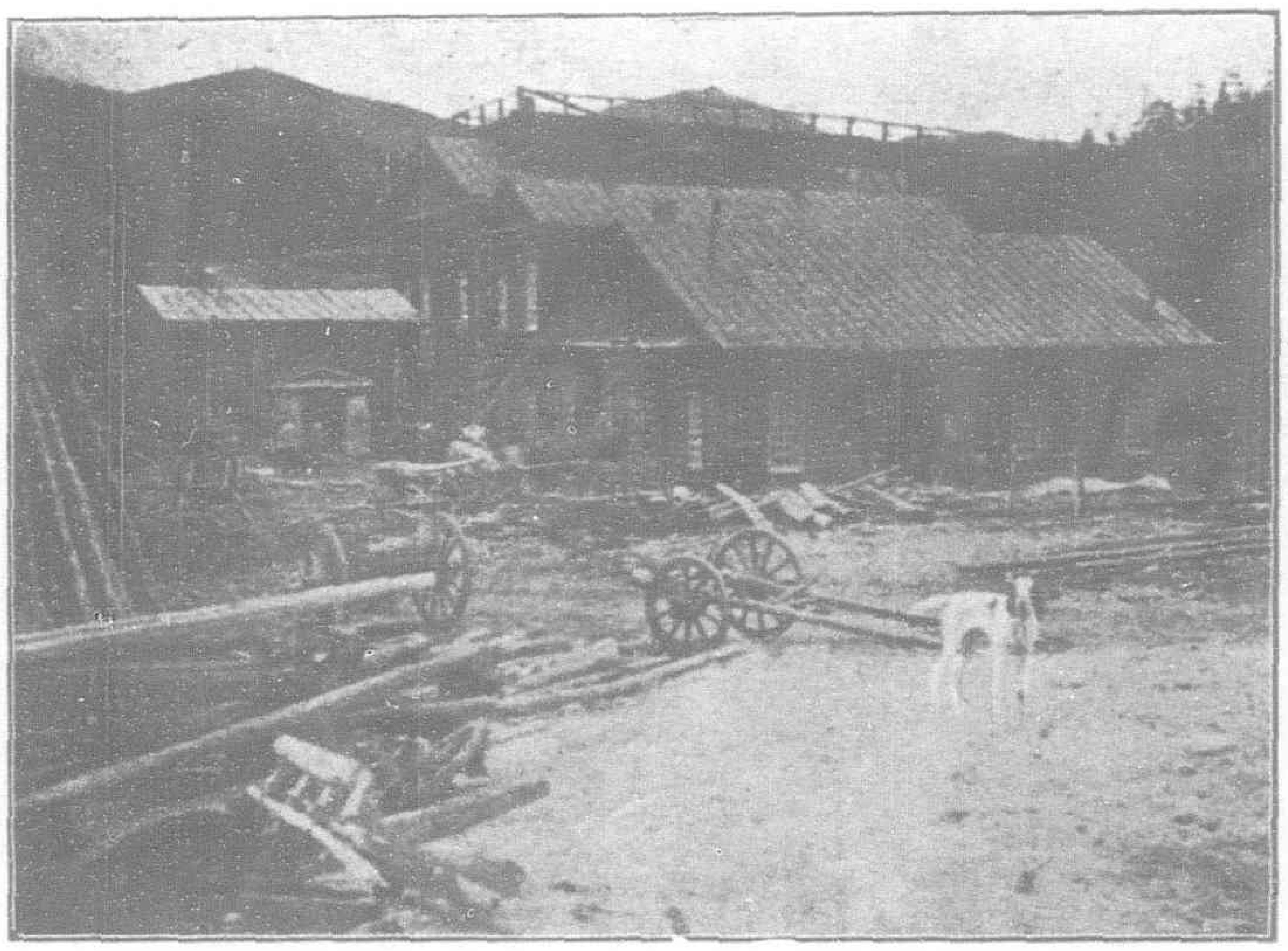


FIG. 7.—BOGOM DAROVANNI MINE, ACHINSK DISTRICT

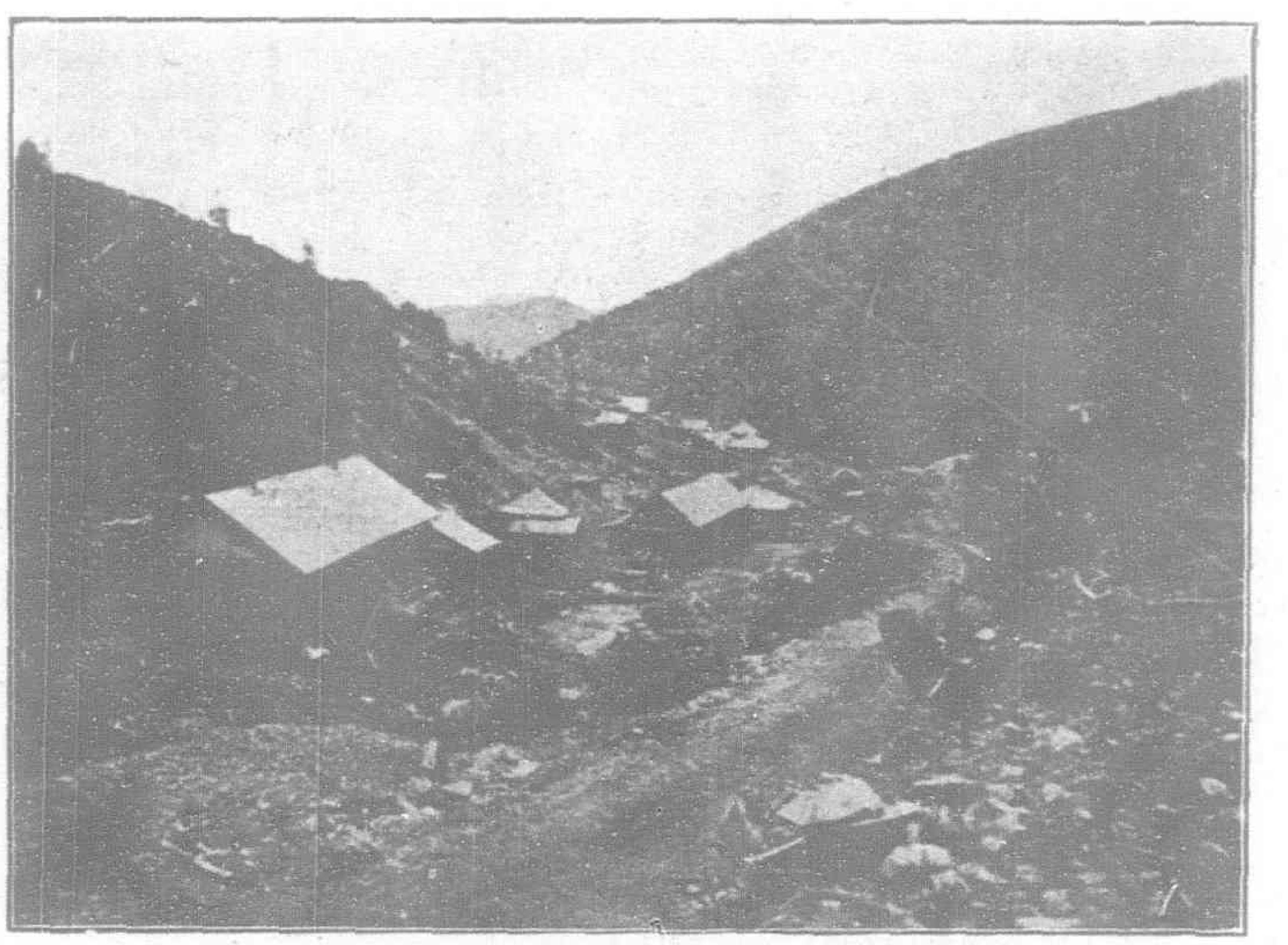


FIG. 8.—WORKMEN'S QUARTERS, BOGOM DAROVANNI MINE

RESUME OF THE GOLD-MINING INDUSTRY IN WESTERN SIBERIA

(Concluded from page 221.)

40-h.p. Tangye engine. Krupp automatic feeders are to be installed between the Krupp jaw-breaker and the mills; temporarily the ore was conveyed from the breaker to a bin from which it was shoveled into the mills.

The rollers and mills were supplied by Thomas Yates, of Ekaterinbourg, in the Urals. Bed-plates of chilled cast iron can be had from the Gurievsk iron works belonging to the Imperial Cabinet and situated in the Kouznetzk District of the Government of Tomsk, and distant about 150 miles from the center of the Mariinsk gold mining district. Contrivances for saving mercury have been put up and give very satisfactory results. Besides the main engine of the mill there is a small steam engine to run the dynamo for lighting. As the amount of tailings accumulated in dumps near this and two old stamp mills of a neighboring claim worked for over twelve years is considerable, a cyanide plant is to be put up shortly. The output of this mill for 1904 was 13,079 oz. gold from 10,271 tons of quartz crushed, an average of 1.27 oz. per ton of ore.

Most of the smaller plants in this and the neighboring Achinsk district differ from the above by the number and size of the roller mills and the nature of the motor. When plenty of water is at hand, simple water wheels are used. In one of the larger properties on the Sarala the Chilean mills are placed by twos in two different buildings at a short distance along the same gulch, in order to use the water a second time. The upper two mills are run by an Escher Wyss turbine, the lower by a Queva.

The Bogom-Darovanni mill in the Achinsk District, near the mouth of the Fedorofski Klutch, a small tributary to the mountain stream Sobaka, is of a quite different type. It is a twenty-stamp Krupp mill, as seen in *Figs.* 6 and 7. The weight of stamps is 1040 to 1280 lb.; speed, 90 drops per minute; height of discharge, 7 in.; screen, 720 to 900 apertures to the square inch; duty per day of 20 hours, from 25 to 32 tons, or, on an average, about 1½ tons per stamp of very hard quartz with diorite. The mill is activated by a Girard 60-h.p. turbine or, when water is scarce, by a 54-h.p. Tangye engine. A general view of this mine is shown in *Fig.* 8.

As the development of the mines of the Bogom Darovanni and neighboring claims promises a larger output of ore than the mill can manage, another plant of four Chilean mills run by Pelton wheels is going to be put up; ditches and flumes from the neighboring main stream Sobaka, and masonry works for the mill, are in construction. A cyanide plant is also to be put up in the near future; the masonry work for it is ready. The output of the mine for 1904 was 10,649 oz. gold from 8874 tons of quartz crushed, an average of 1.20 oz. to the ton.

The above two mills are the largest and best equipped in Western Siberia. Other important mills in the Mariinsk District produced in 1904: Sixth Berikal, 9477 tons crushed, 9460 oz. gold recovered; G. M. Miller mine, 4358 tons crushed, 1934 oz. recovered. In the Achinsk District, nearly the whole of the remaining 9600 oz. was produced by three mills.

In general, the aspect of gold mining in Siberia is far from discouraging, and, as soon as the present general political difficulties in Russia shall come to an end, a rush for the gold mines may be expected. There are many chances that this time it will cover most of the Siberian gold fields and not be a failure, like the local rush in the South Yenissei District in the eighties.

Prices and wages are somewhat higher in the gold-mining districts on account of the war and its consequences. Workmen of the first grade get 50 to 60c. per day; second grade, 35 to 45c. per day; skilled labor, 75c. per day; mechanics $30 to $37.50 a month; foremen $50 a month. Rye flour, 0.75 to 1c. per lb.; wheat flour, 2.5 to 3.5c.; meat, 2.5 to 3c.; sugar, 9 to 12c.; butter, 14 to 16c. per lb.

Still these prices are not unduly high, and not much different from those quoted in 1903.

SHIPPING ON THE YANGTZE

Consul Thornwell Haynes, writing from Nankin to Washington, says that most foreing enterprises in China are conducted under the terms of what are called *concessions*, which are practically analogous to American public franchises. He adds:—

But shipping on the Yangtze is not. It is a free-for-all concession, and at present there are many striving to get the largest share. It is no wonder. The Yangtze Valley is the commercial heart of China and comprises an area of 600,000 square miles, inhabited by approximately 180,000,000 industrious and peaceable people who do not hesitate to buy. The rivers of China are of the utmost importance to the empire, inasmuch as they afford what is practically the only means of communication between the different territories. Roads are few and bad, the highway consisting in most instances of the merest track. The great rivers, however, with their numerous tributaries and canals, traverse the empire in every direction and afford a cheap and ready means of transport, which has rendered the vast trade of the country possible.

The most important of the rivers of China are the Yangtze, the Hoangho, the Si, the Pei, and the Min. The Yangtze ranks third in size among the rivers of the world. It traverses the provinces of Sechuan, Yunnan, Hupeh, Anwei, and Kiangsu. Its total course covers more than 4,000 miles, and it is navigable by large vessels for more than 1,000 miles from its estuary. Its most important tributaries are the Kia-ling and Han. It also affords communication with two lakes of considerable extent. The most remarkable feature, perhaps, in connection with the Yangtze is its extraordinary variation in level, which alternates as much as 100′ in the higher reaches, where the banks narrow and confine the stream within a series of remarkable gorges, and 50′ at Hankow, where the river is more than a mile wide. These phenomena are due to the summer melting of the snows on the Tibetan plateau, where the river takes its rise at a height of more than 15,000′ and the water rushes down in a flood which at times submerges the country for a breadth of 20 miles.

The most important adjunct to the rivers named was the Grand Canal, an undertaking completed more than 600 years ago. This undertaking runs its course from Tientsin to Chinkiang, thence to Hangchow, crossing on its way both the Hoang-ho and the Yangtze. The total distance traversed is something over 600 miles. This wonderful engineering feat has lately fallen into a very bad state of affairs, and partly owing to the change in the course of the Yellow River, partly on account of the improvement effected in steam communication by sea, the canal is used only by small junks. The importance of the Yangtze, as well as all the other waterways in China, lies in the fact that the roads of the empire are, as already stated, the worst in existence. Where paved they consist of blocks of stone imbedded loosely in the surface of the ground and which are frequently abstracted by the people for their own use, and in the hilly districts the tracks are utterly neglected.

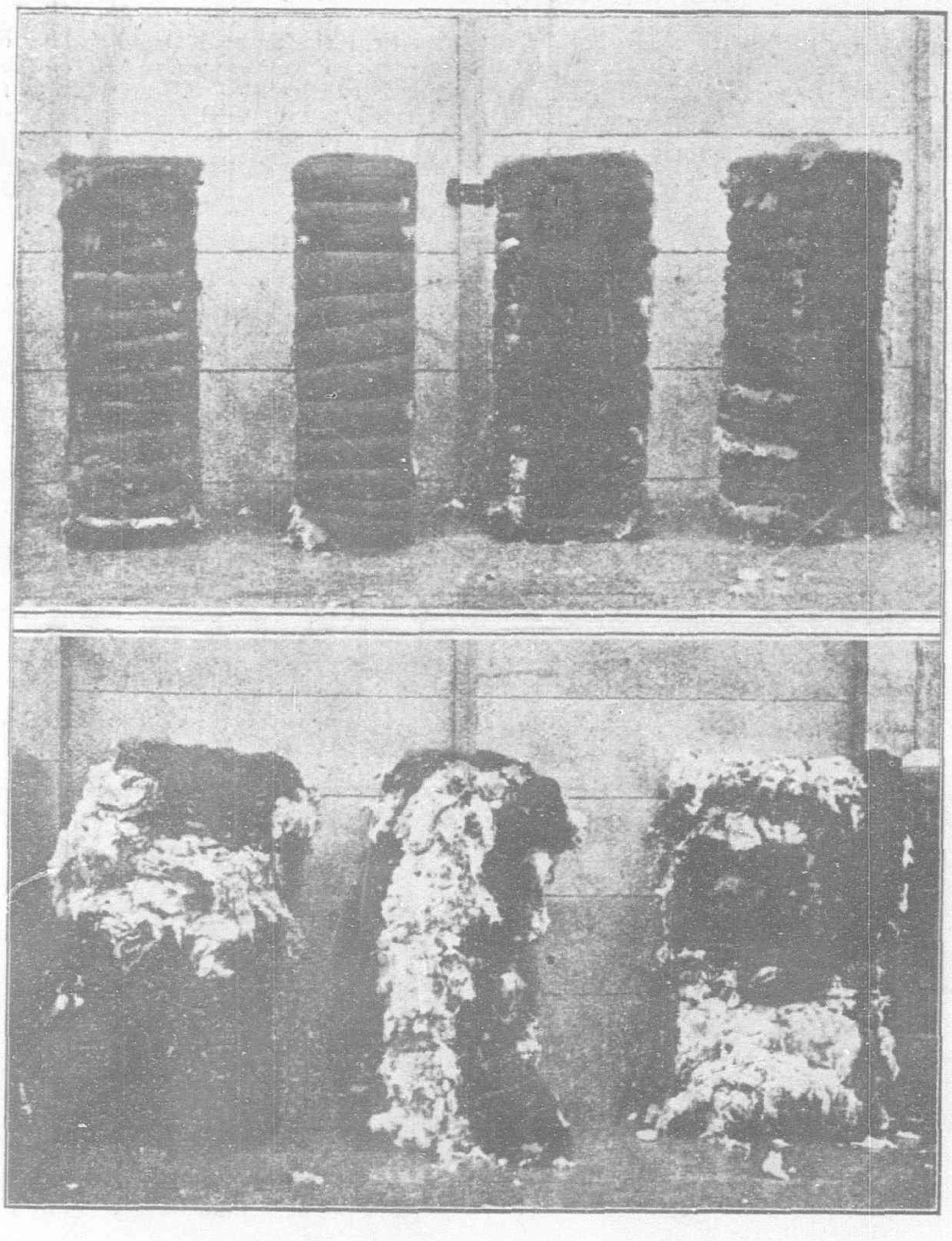
Five nationalities, the British, French, German, Chinese, and Japanese, represented by eight companies, are striving for the Yangtze River trade. The British are represented by two companies: The Indo-China Steam Navigation Company, whose agents in Shanghai are Jardine, Matheson & Co., and the China Navigation Company, whose agents are Butterfield & Swire. The Chinese company, the China Merchants' Steam Navigation Company, have a pool with these two companies. A ticket bought on one line can be changed indiscriminately to either of the other two. Their receipts for cargo are said to be shared proportionally. Further, some assert that the capital in the China Merchants' Steam Navigation Company is composed mostly of British; others say it is entirely Chinese. Certain it is, capital invested must be in a Chinaman's name. The Indo-China Steam Navigation Company have four regular steamers, ranging from 1,544 tons to 2,389, the largest vessel being especially well equipped with electric fans and lights throughout.

The China Navigation Company have four steamers, ranging from 1,802 tons to 2,831. The French are represented by three sister ships, each of 1,727 tons, owned by the

(Continued on page 229.)

AMERICAN COTTON IN JAPAN

Mr. Hunter Sharp, American Consul at Kobé, furnishes to the Bureau of Manufacturers of the Department of Commerce and Labor, at Washington, an illustrated report on the condition in which American cotton reaches Japan. The photographs he sends tells the story, which is simply another chapter of bad packing in the United States for the export trade. *Daily Consular and Trade Reports* says in this connection that possibly in time American exporters will learn to pack better; they would learn it now if they will but examine these contrasting pictures with a full realization of what it means in the future in making sales abroad.



BOMBAY COTTON IN KOBE, AMERICAN COTTON IN KOBE

According to Consul Sharp, the Bombay cotton is the best packed of all that reaches the Japan market. The bales are of uniform weight of 400 lbs., and it is seldom necessary to weigh more than 10 out of every 100 when taking delivery. They are wrapped in good quality of sacking and arrive without being torn or damaged, and the marks are plainly legible.

In strong contrast with the bales from Bombay is the condition in which cotton from the United States reaches Japan. The sacking is a very coarse kind of gunny, which is easily torn in transit, and as there is no protection by sheds at the places of packing and transhipment, the cotton generally receives much damage from the weather. As a consequence the marks are always indistinct and are frequently entirely obliterated.

Another point which militates against American cotton is the great variety in the weight of the bales. Uniformity in this respect is very desirable, as it greatly facilitates the estimating of space required for storing and lightering. Sheds have been erected at Kobé by the Tokyo Warehouse Company, in conjunction with the dealers in cotton, for the storage and handling of such stuff. This company has three sheds with a ground floor-space of 111,592 square feet, two brick warehouses covering 40,993 square feet, two piers for lighters, each 36×72′, and has also built 2½ miles of railroad track in the compound.

"Complaints are also made," says Consul Sharp, "of the inferior packing of other American goods, such as machinery, a large and growing export, the cases being made of too light material, with the nails not strong enough to bear the strain of the rough handling during a long voyage. Machinery from Europe arrives in strong cases, the lumber employed being 1″ and 2″ in thickness, bound with heavy iron bands, the ends being supported top and bottom by cleats, connected with short bands of iron around the sides. Other articles from Europe, such as piece goods and articles of clothing, are packed in cases made of ⅞″ boards. Inside of the watertight tin lining, which fits the case closely, is packed heavy wrapping paper. The articles are made up in attracting packages of pasteboard boxes. American exporters in their own interest would do well to consider the foreigner's methods of packing."

HONGKONG DOCK EXTENSIONS

Another step marks the project for the extension of No. 1 dock at Kowloon, Colony of Hongkong, and this is seen in the publication in the *Official Gazette* of a notification giving the particulars and conditions of lease of Marine Lot No. 3, Hung Hom. The land in question is, it is presumed, to be acquired for the purpose of extending the site of the present No. 1 dock, a scheme which was proposed at a private meeting which followed the last half-yearly ordinary meeting of the shareholders of the Hongkong and Whampoa Dock Company.

According to the description of the lot which will be offered for lease, the land comprises 175,500 square feet, or about four acres. The annual rent is $1,410, and the upset price $39,488. Under the terms of the sale, the lease will be granted to the highest bidder, and no bid under $200 will be accepted. The purchaser must pay into the colonial treasury the full account of the premium offered for the lease within three days of the sale. After reciting the usual forms required for marking out the land, etc., the notification states that the purchaser "shall reclaim the entire area of the lot and shall build and finish, fit for occupation, before the expiration of four years from the day of sale, in a good, substantial, and workmanlike manner, one or more good and permanent messuage or tenement upon some part of his lot, with walls of stone or brick and lime-mortar and roof of tiles or such other materials as may be approved by the Director of Public Works, and in other respects in accordance with the conditions of all Building Ordinances now in force in the colony which are applicable, and shall expend thereon a sum of not less than $40,000 in rateable improvements." The purchaser is required to maintain the land in a sanitary condition, and shall pay into the treasury a proportionate part of the annual rental on December 25th, and the annual rental by half-yearly payments during the term of 99 years. Should the lessee fail at any time to use the land for the purposes specified without the consent of the Government, then the crown may re-enter the land, foreshores and sea bed included in the lease "or on any portion thereof in the name of the whole and thereupon the same shall be forfeited to and vest in the Crown." All mines and minerals under the land in question are reserved to the crown. There is a further *proviso* that the lessee shall have the option of renewing the lease for a further term of 99 years at a crown rent to be fixed by the surveyor representing the crown. Should the purchaser fail to comply with the conditions, the crown may either enforce the sale or re-sell the property, and should there be any increase in the premium or purchase money at the re-sale that increase will be retained by the crown, but if there is a deficiency the defaulter must pay the difference.

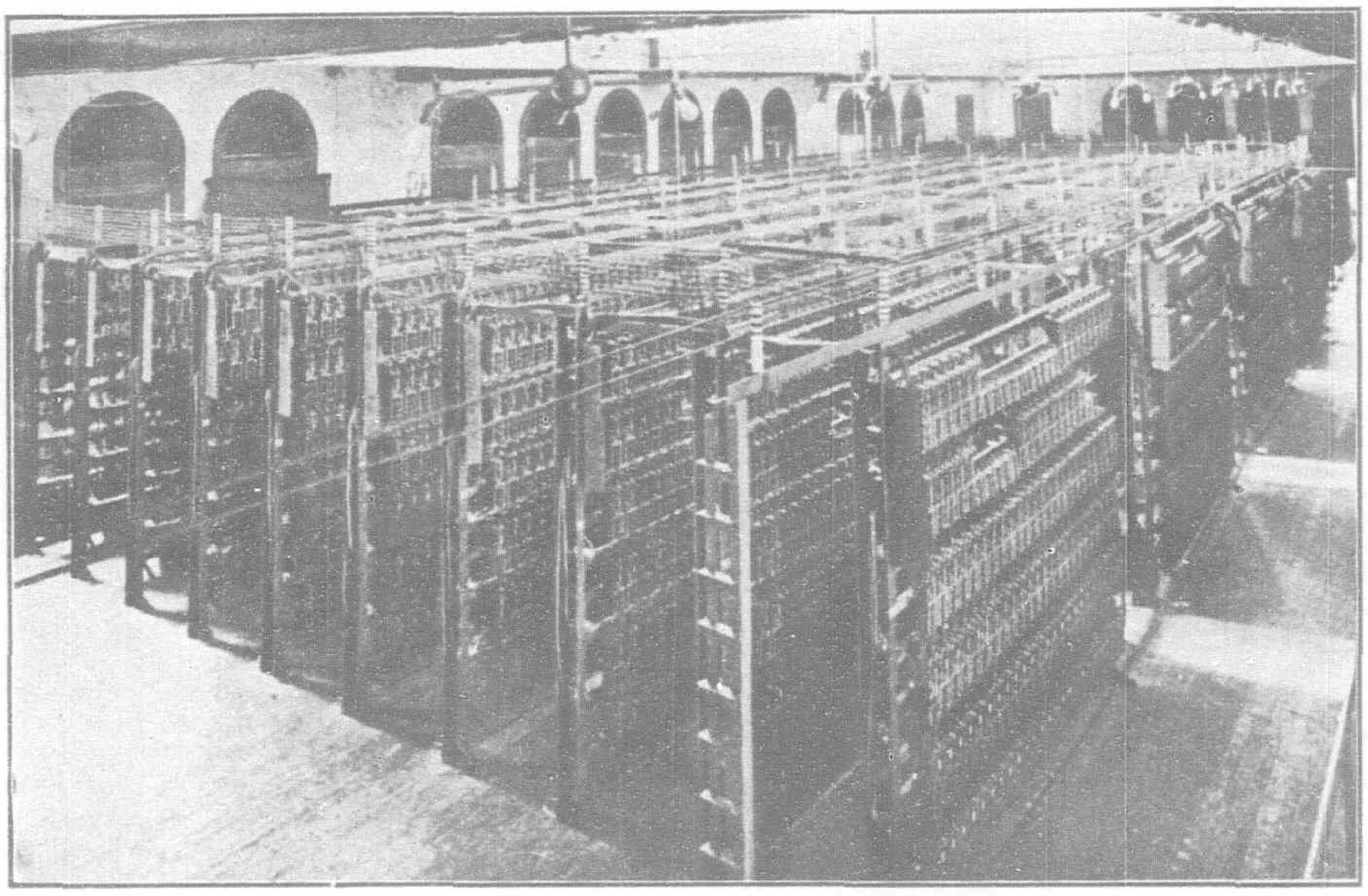
OPEN DOOR IN SIAM

An American consular report, emanating in Germany, advises that according to reports from German business men resident of Siam, this latter country is not only well governed, but from year to year is presenting ever-increasing opportunities for the sale of manufactured goods. This recognition of Siam's liberal attitude towards foreign trade is merited. During the past 10 years such progress has been made in organizing the internal machinery of the State that foreigners may now, with safety and with some show of profit, invest capital in the country without running the risks which had to be taken into consideration in former years. Siam has inaugurated the policy of the open door, and all foreigners are given an equal chance in participating in the commercial and industrial development of the country.

The commerce of Siam at present is equally divided between English and German traders. Steamship lines of both nations call at Bangkok, and many officials of both nationalities are employed in the Government's railway and telegraph departments. The recent increase in the number of vessels in the service between Germany and the Far East would indicate that German merchants are determined to hold their own against the ever-increasing pressure of not only English, but especially Japanese, competition. Siam offers a field for railway supplies, road-making machinery, and farming implements, and the Germans seem to be prepared to make the most of it. However, the English are fighting hard for trade supremacy in Siam, and now and then American invasion is noticed.

AUTOMATIC TELEPHONE AND ITS INVASION OF THE FAR EAST

Automatic telephones have reached the Orient. An advance guard of the *central destroyer* was heralded from Shanghai the past month, where demonstrations with this latest improvement in telephony were commenced. Shanghai press reports prove the tense interest of that metropolitan business community in what has been announced as the panacea for telephone ills.



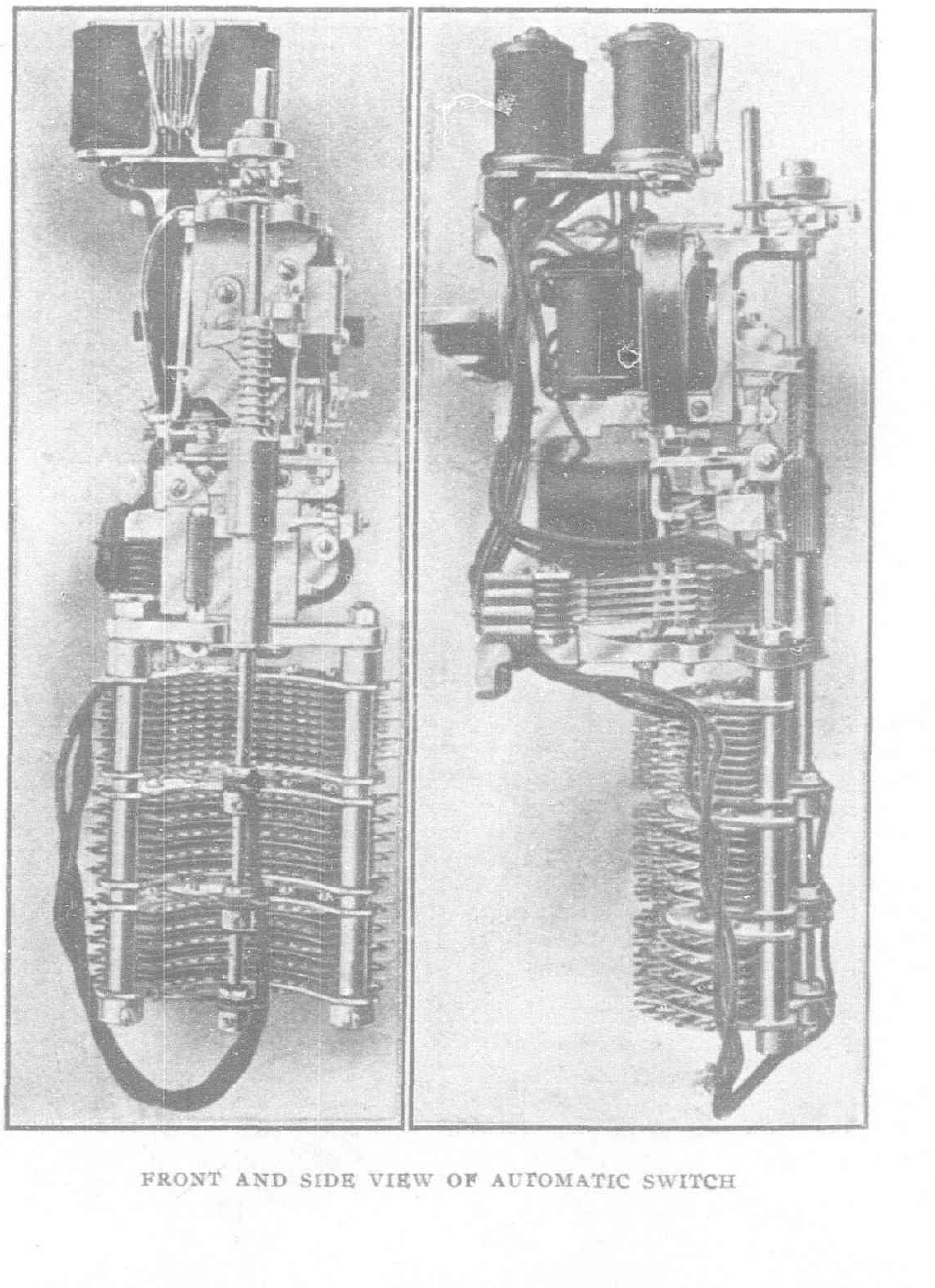
EXCHANGE AT DAYTON (O.), U. S. A., WHERE 6,000 STATIONS ARE INSTALLED, SHOWING ARRANGEMENT OF THE SWITCHBOARDS

An aggressive campaign has been commenced to install the automatic telephone throughout the Far East. Representatives of the Automatic Telephone Construction Company, which has secured from the Automatic Electric Company, of Chicago, U. S. A., the right to introduce the new apparatus into Asia, have a complete telephone plant for demonstration purposes. It has a capacity for 22 telephones, and is a unit from a 10,000-phone system, the apparatus all being usual size, and the calling is exactly the same as in a large operating plant. Each city of the Orient will be visited, and residents of each will be given full opportunity to test the automatic in any manner they see fit.

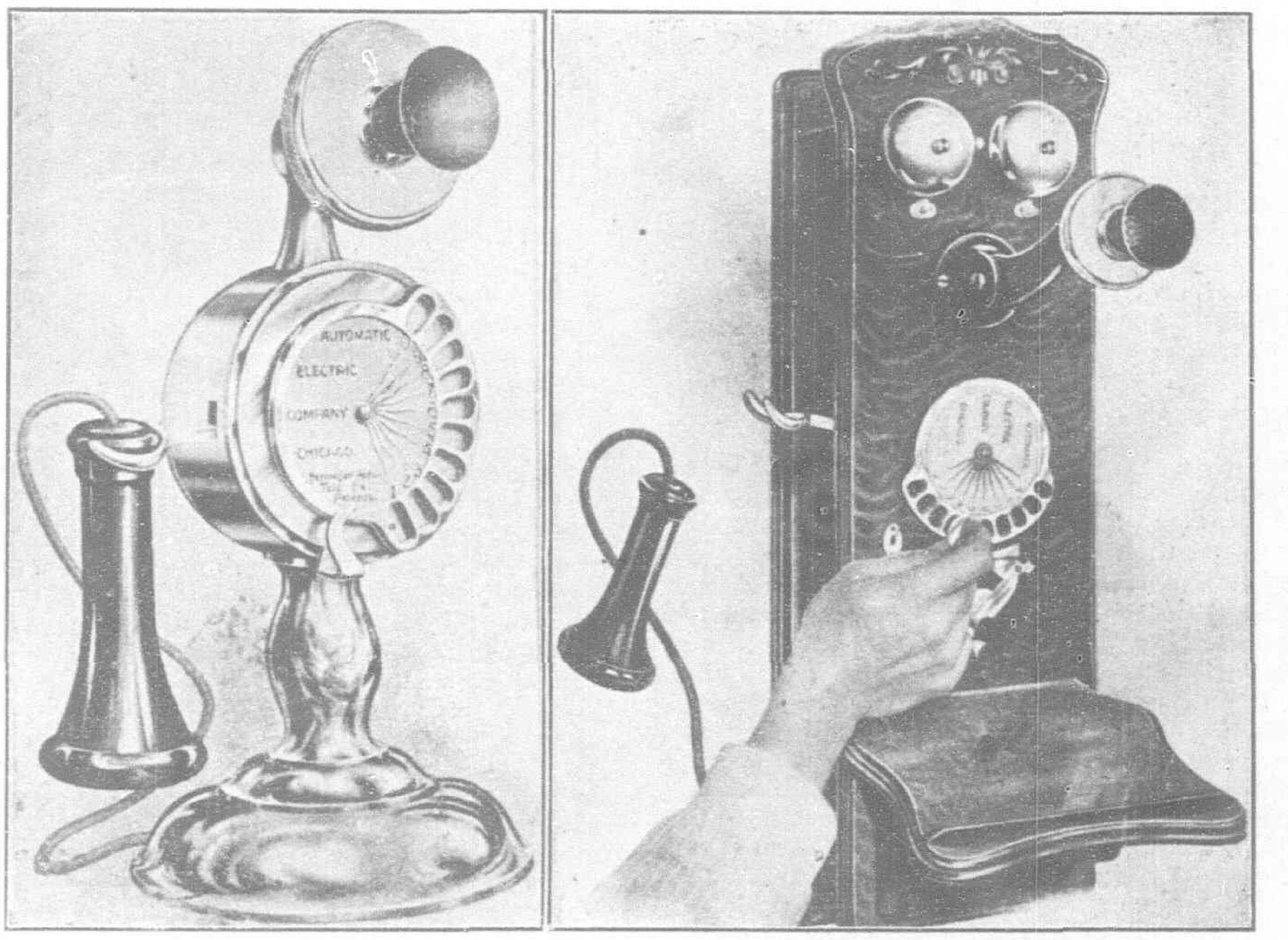
AUTOMATIC TELEPHONY.—Automatic telephony, new to the Orient, is not new in either a mechanical or commercial sense to America. Automatic devices have been experimented with there for 20 years, obedient to the unquestioned conviction that this is the natural ultimate method of connecting telephone-users' instruments. Commercial success with the automatic has been of briefer record, the oldest exchange of any size using such appliances having been built less than five years ago. It may be said with historic accuracy that the automatic did not prove itself to any considerable community of telephone-users earlier than two or three years ago. Messrs. Swift & Company, of Chicago, have been using a private exchange of the Strowger automatic patent for a decade and a half, and several private plants have been in operation for a considerable period. But only after the Chicago system of automatic was built, with an approximate capacity of 10,000 phones, in the spring of 1903, and the Dayton (O.) plant at the same time, did the world recognize that the Strowger automatic telephone was a commercial success. That same fall Grand Rapids (Mich.) installed another automatic plant, and since then, especially during the past two years, the exchanges built and building have increased at a phenomenal pace. Manufacturers of the automatic state that at the present time there is in operation or ordered for immediate installation, about 70 public exchanges, and a large number of private exchanges. Applications are being made to all the large cities of America for franchises, and the people using telephones are gradually forcing municipal governments to give the new invention an opportunity to prove itself. On the Pacific Slope, where the Bell telephone interests were not so well intrenched as in the East, all of the big cities are installing automatic plants, and a long-distance system is being constructed connecting Seattle (Wash.), with San Diego and Los Angeles (Cal.).

STROWGER SYSTEM.—There are but two new features about the Strowger automatic—which is the new arrival in the Orient—the calling device and the switch, the latter performing the duty of *central* in manual systems. The calling device is nothing but a mechanism so constructed as to enable any telephone subscriber to send any desired number of electrical impulses over either of the two telephone wires. The switch is actuated by electro-magnetic energy. Electrical impulses energize magnets, attracting their armatures. These armatures are connected with pawls which lift or rotate a small vertical shaft about the diameter of a lead-pencil. For the upward lift of the shaft, a pawl attached to the armature of what is termed the vertical magnet, finds lodgement in one of 10 horizontal teeth milled into a hub fastened to the shaft. One impulse over the wire ending in the vertical magnet, lifts the shaft one tooth, or a distance of $\frac{1}{8}''$. As the shaft is very light, and electrical impulses with the corresponding attraction of the armature instantaneous, the time required to lift the shaft one step is a small fraction of a second. The shaft may be lifted 10 steps in much less than a second.

An impulse sent over the other wire of the two required to form a metallic talking circuit for telephones, reaches what is known as the rotary magnet. This controls an armature moving on a horizontal plane, rather than a vertical one, and has the power of rotating the shaft to any one of 10 positions. Thus it will be seen that the shaft may be lifted to any one of 10 vertical positions and then rotated to any of 10 horizontal positions, making 100 positions for contact in any single switch. Contacts are made by little arms attached to the bottom of the shaft described. As the shaft is lifted or rotated, the tips of the little arms are brought against



FRONT AND SIDE VIEW OF AUTOMATIC SWITCH



DESK AND WALL TELEPHONE, THE LATTER HAVING A LOCAL TALKING CIRCUIT

contact points which terminate the wires with which connection is sought.

After the instrument is used, pulling down the hook on which the receiver hangs sends an impulse over each wire at the same time, energizing what is known as a release magnet. This attracts an armature to which is attached the double holding the shaft in whatever position it has been placed by the calling device. Drawing back the double-dog releases the shafts of all switches in use by that line simultaneously, the shafts falling back to normal position by gravity. Briefly, this is an electrical and mechanical outline of the Strowger automatic patents.

The calling subscriber does his own ringing, by pressing a little button on his transmitter. In all of the latest plants erected by the automatic, common battery talking-circuits, are used, the same common battery supplying electricity to actuate the switches sufficing to supply the talking-circuit. This simplifies the circuit problem, gives better tone-transmission, and removes the unsightly local dry batteries from the subscriber's telephone.

TESTS AT SHANGHAI.—In the tests at Shanghai, the demonstration plant proved that any subscriber in a 10,000-phone plant could connect with another in three to five seconds, and would be talking in that time if the person called was prompt to take down his receiver. Also, it was proved that the instant the conversation terminated, the calling subscriber could release the phone to which he had been talking and commence talking to any other, without having to wait for *central* to learn that the conversation had ended.

Another important test made was the absolute impossibility of one subscriber *cutting in* on another line that was engaged. Until two persons who are talking finish and hang up their receivers, no other person can interrupt them or *cut in* to hear what is passing on the line, thus giving the greatest possible secrecy that can be obtained in telephony. There being no *centrals* to connect subscribers, no one save the two persons engaged is aware that the line is busy, and if another subscriber tries to get one of the busy phones, a strong *busy* buzz is heard, telling him that the phone sought is engaged, but not permitting him to hear anyhing passing on the busy line nor interrupting by even an induction noise the users of the busy lines.

In organizing an automatic operating force of employees, a *trouble* clerk is constantly on duty. If one subscriber tries to get another two or three times, which effort need not consume more than three minutes at the outside, and the *busy* buzz is not heard, he is instructed to call the *trouble* clerk at once. This clerk sends notice to the switchroom, where the superintendent can make an electrical test to determine if the bell of the subscriber sought rings. If the bell rings, the only conclusion is that the person called is not in, or not within earshot of the telephone.

All trouble is attended to in the shortest possible time, under the new system. Nearly every trouble that will occur on the wire or in the switchroom, is indicated to the superintendent automatically, so that he can have a *trouble* man repairing it long before a subscriber is aware that his line was in trouble. It is said on authority of the manufacturers that about 80 per cent of the trouble on well-organized automatic systems is remedied before the subscribers are in need of their phones or become aware that anything happened. Thus the least possible inconvenience is given to telephone-users. On the same authority it is stated that in the big automatic systems, where the construction has been up to a good standard, there is much less trouble than with the average manual telephone.

APPARATUS AND CONSTRUCTION.—Both the wall and desk phones furnished by the automatic for these systems are small, very neat and simple in construction. The desk phones are made of spun brass, highly nickled, and the wall phones are an oaken box 8×8″, on the front of which is the calling dial and on top the transmitter. The automatic company has constructed some systems with a local battery talking-circuit, in which work the wall phone is slightly larger, as it must accommodate two dry-battery cells. With the central energy talking-circuit, which is the latest construction for all large systems, the size of the wall phone is reduced and made neater.

In constructing an automatic system, the manufacturers say that the cost on the average will run 10 to 20 per cent higher than for a manual system, due to the more costly switchboard. In operating, however, there is said to be a great economy, which enables any company using the automatic to furnish such service for as much or materially less than a manual service. In a manual system the usual tendency is to increase cost of service rapidly as the system grows in number of phones, while with the automatic its champions say that best results within can not be attained in a system under 1,000 phones, and from that number to 10,000 there should be no increase in the charge to the user whatever. Above 10,000 phones, the increase in charge for automatic, if any is made, should not be more than a trifle to the consumer.

OTHER ECONOMIES.—Space in the central exchanges is another point on which the automatic people claim important advantage. One switchman can attend to 1,000 or 1,200 switches of the automatic type, his sole duty being to walk between the rows to determine if there is any trouble. This compression of the plant enables the automatic to occupy a space about one-quarter of that required for manual operation.

One of the most vehement arguments in the economy of extension advanced by the automatic people is that increase in size of their system is accomplished simply by adding more switches, placing them in shelves arranged for the purpose. There is no limit to such economical expansion, as enlargement is simply adding more units. With the manual, it is presented, old switchboards must be torn out and entirely replaced when their capacity has been reached, entailing whatever loss this may mean.

A strong company of capitalists, most of them Los Angeles bankers, has been organized to introduce the automatic in the Orient. The company has hastened to this field because of the complexity of languages here, which makes it so difficult for one national to make a *central* understand what number he wants, if the *central* is of a race speaking a different tongue. Repeating numbers, errors in the understanding of the *centrals*, saving of time, and the vexation of spirit which is said to be making all Oriental residents a gray-haired people since the telephone came into use, are promised immediate alleviation by the aggressive interests back of the new automatic telephones.

SHIPPING ON THE YANGTZE

(Continued from page 226.)

Compagnie Asiatique de Navigation. With each first-class cabin is a bathroom, and on each are two suites of rooms.

The Germans are represented by two companies, the Hamburg-American and the North German-Lloyd. The former company runs two steamers, both of the same tonnage, 1,145. The North German-Lloyd has three steamers, all of the same size, 1,682 tons. The China Merchants have five steamers, the largest 2,468 tons. The Osaka Shosen Kaisha has four vessels, the largest of which is of 1,758 tons. Another Japanese company, the Nippon Yusen Kaisha, has two, each of 1,140 tons, as well as three plying regularly between Hankow and Yokohama.

Altogether it will be seen that there are 27 vessels after the Yangtze trade between Hankow and Shanghai: British, 8; French, 3; German, 5; Chinese, 5; Japanese, 6. If to these are added the Japanese vessels in service between Japan and Hankow the total is 33, bringing the number of Japanese vessels to 12. Moreover in the service between Ichang and Hankow there are a number of vessels. Altogether, 18 British, 16 Japanese, 8 Chinese, 5 German, and 3 French steamers are in competition in the Yangtze service. But there are also a number of independent vessels which join in the competition from time to time. In consequence of this intense rivalry excessive rate cutting in the conveyance of passengers and cargo has been and is being indulged in to the discomfort of all the companies concerned.

Japanese advantages consist in proximity, cheap labor, quick transportation, knowledge of the country's customs, and in the confidence the Chinese have in Japan. They also take foreigners in first-class Chinese vessels. In vessels of other companies no intermingling is allowed. The labor employed on the vessels is cheap, efficient, diligent, and thrifty. This labor can not only rival the best operatives on other boats on the Yangtze, but can save money out of its meager pay. From such advantages it would seem that the Japanese must eventually win.

NEW ADMIRALTY DOCKS, HONGKONG

In a recent issue the *Hongkong Telegraph* gives some interesting details of the progress of construction and other engineering operations at the new Admiralty Docks now being built in the colony. The most valuable addition that is at the moment being made there is an entirely new hoisting plant which is equipped with the largest steel cranes in the Far East.

For two decades or more the Hongkong Naval Arsenal has had to depend, for its hoisting gear, upon cranes and sheers of antiquated conception and feeble power; but about a year ago the Admiralty woke up to the necessity of supplying something better in the shape of material for lifting guns and other heavy weights from ship to shore, and *vice-versa;* and concluded a contract with Messrs. Cowans, Sheldon & Co, Ltd., of Carlisle, for the erection, within the local yard, of three 20-ton and one 50 ton Fairbairn swan-necked cranes. The first of these cranes to be erected in the Hongkong Naval Dockyard was one of the 20-tonners, and the erection of this great piece of machinery was, as will be the case with the others, left in the hands of Mr. McGregor, the supervising engineer of Messrs. Cowans Sheldon, with the satisfactory results which will be seen later on. These cranes mark an epoch in hoisting power in the Orient, since not only are they more powerful than anything of their kind in the Eastern world, but are also the sole examples of their capacity outside the United Kingdom. They are intended to be worked electrically, but seeing that, at present, Hongkong has no electric power to give them, they will be worked for the time being by steam, for the supply of which the contractors are also furnishing engines and boilers.

The jib of each crane is strong-box section, constructed of mild steel plates and angles, all securely riveted, and rising from the base to the jib-head in a curved form; hence the appelation *swan-neck*. In the case of the 20-ton cranes, the radius of each from the centre of the base to the centre of the main lift is 60′; the height from the ground level to the centre of the jib-head is 65′, and the length of the wire rope is so arranged that the hook of the crane may be lowered 35′ below the ground level with not less than three complete turns remaining upon the barrel. Needless to say, special foundations have been made both on the arm of the naval *Camber*, and on the east and north sides, for the reception of these cranes. Pending the necessary supply of electric power, the lifting gear is to be driven by a motor, the first reduction gear being of steel with teeth machine-cut from the solid raw forged steel; the barrel of the winch is of cast-iron turned and grooved to fit the wire rope. With regard to speed it is understood that the gearing is of sufficiently ample strength to deal with the test load of 30 tons which is the full test weight for these 20-ton cranes, the working load of 20-tons should, it was arranged, be lifted at least 20′ per minute, and a light lift was to be provided for capable of dealing with loads up to five tons at the rate of 80′ per minute. The brake gear, which is a most serious point in dealing with weights of this enormous character, is so arranged that it may be worked either by hand or by an electro-magnet connected up in series with the lifting motor, so that whenever the current is applied to the motor, the brake is automatically released; but should, from any cause whatever, the current be broken, the brake is sufficiently powerful to take on and hold the test-load of up to 30 tons. The revolving gear is so arranged that the cranes will turn at a speed of 150′ per minute at the hook, with the working load of 20 tons suspended; but the first tests have proved that, both in this respect and in lifting speed, they can do better.

Not the least interesting item in the part that these heavy weight lifters will play is the foundation, the plates of which are cast-iron and adapted for live-roller arrangement. The foundations go 29′6″ into the ground and the foundation pit is lined with a cast-iron cylinder of 1″ in thickness; the joints are necessarily water-tight, and the flanges machine-faced, while the revolving racks, secured to the top of the foundation plates are in segments. A steam pump, which is also capable of being worked manually, is fitted with the object of keeping the foundation recesses dry. As to electric motors each crane is fitted with two of the totally enclosed and direct-current type, capable of developing 220 volts at the terminals. The engines, which will provide the power for driving the cranes, until such time as a supply of electricity is available, are of the double-cylinder type, fitted with link motion, and designed to do the full work with a pressure of 90 lbs. to the square inch. The boiler is a vertical one and bears a maximum working pressure of 100 lbs. to the square inch.

After the erection of the first 20-ton crane the local authorities at the Naval Yard made the necessary official tests. The crane lifted her test-load of 30 tons, deflecting only $4\frac{9}{16}''$, and straightened herself up again without any sign of strain. The brake-test was then made, and, without any steam control, the crane lowered her burden in capital form. This trial was a severe one for the man at the brake, for there is always a possibility in a heavy test of this kind of the brake *firing*, an occurrence which would generally be calculated to end in the total extinguishment of the plucky operator. In lifting her specified weight of 20 tons, this crane showed a deflection only of 3″, and again went back stiff-necked and erect, without any sign of strain, while as to speed, she lifted the irreducible test-minimum of 30 tons 20′ in 46 seconds, being 54 seconds in advance of the contract demand, and in the matter of revolving speed, she did 188′ in 88 seconds, the contract calling only for 150′ per minute. The crane put a brilliant climax to her trials by lifting a weight of 5 tons to a height of 20′ in 12 seconds.

THE SIBERIAN RAILWAY

The committee of the Russian Railway Department, which has been examining the question of the construction of an Amur railway, has recommended the immediate extension of the Transbaikal line to Pokrovskaia, at the confluence of the rivers Shilka and Argun, at the cost of the Government.

Mr. E. C. Jennings, who has just made the journey from Vladivostok to Moscow by the Siberian Railway, gives the following respecting his experiences:—

"As the trains only run weekly from Vladivostok a great many passengers are invariably left stranded for a week or two. The trains between Irkutsk and Vladivostok and *vice versa* are good, and the journey averages 4½ days. The dining-cars are large and seat 48 people. On arrival at Irkutsk at about midnight a scene of indescribable confusion ensues. Luggage is either left scattered about the uncovered platform or else is taken into a small buffet, which also has to do duty as a ticket-office and waiting-room. The railway officials in Vladivostok are only allowed to issue a certain number of through tickets to Moscow, the remaining passengers being compelled to book again at Irkutsk, and a rush therefore ensues to get places in the Irkutsk-Moscow train. Trains run to Moscow and *vive versa* there times weekly. One train each way consists of a Wagon-Lits *train de luxe*, and intending passengers would do well to arrange for seats in this train, which is very comfortable, with a good cuisine, and officials who speak other languages than Russian, which is not the case in the other trains. The Russian trains are invariably crowded with officers of the Army and Navy going to and returning from Russia on leave. The carriages are all old ones repaired, the second-class being very dirty. The lavatory arrangements are bad—soap, towels, and sometimes water being conspicuous by their absence. The restaurant-cars on the Russian trains are disgraceful. The car is a small one, accommodating only 16 people, and as the passengers numbered over 60 the only alternative to waiting in the corridor for an hour previous to the luncheon hour was to wait till about. 3.30 or 4 p.m., when the last "batch" succeeded in getting places. The meals, when obtained, were well cooked, and the food was good. The restaurant-car prices on the Vladivostok-Irkutsk train were very high, notwithstanding the fact that the war has been over nearly a year. I should strongly advise any intending traveller to so time his arrival in Moscow or Irkutsk that his train connects with the comfortably *train de luxe*, and leave the Russian trains severely alone.

MOTORS IN SIAM

A remarkable fact, recorded in a British consular report on the trade of Bangkok, is that the imports of cycles and motors have sprung fom about $5,200 gold in 1904 to $110,650 in 1905. The increase, it is explained, is really due to the introduction of private motor-cars. The roads of Bangkok are poor and limited in extent and conditions are quite unfavorable to the demand for motor traction as a medium for heavy transport, and the importations of motors are necessarily confined to the limited requirements of a limited number of private owners. Owing, however, to the large extent to which Bangkok and the surrounding country is provided with and depend upon waterways, circumstances are distinctly favorable to the introduction of marine and river motors. It is not sufficient, however, that the manufacturers should distribute catalogs or acquire local agencies. An intelligent study of the needs and conditions of the neighborhood by a skilled representative is essential. The motorcars, which have found their way to Bangkok, have been for the most part procured through British agencies.

JAPANESE CEMENT

The lively demand for cement which seems certain to come from Korea, Manchuria, parts of Russia and other eastern countries, promises the opening of an era of expansion in this line of manufacturing industry in Japan. And this, in turn, augurs keen competition in the cement market. Nine years ago Japan's export of cement amounted to only $8,000 gold in value, but in 1903 it had increased to $295,000. The war temporarily checked the growth of the industry, the restoration of peace revived it. Not only is the demand for Japanese cement springing up in Korea and Manchuria, but large orders, received from San Francisco, brought about by the recent catastrophe, gave a great impetus to it. All the stock in the market has been cleared and the manufacturers are busily engaged in trying to meet requirements. The amount exported in 1806 was 3,096,858 lbs., valued at $12,686 gold; in 1905, 42,149,240, valued at $197,696. Up to the end of May this year the value of cement exported had reached over $211,500 gold, while the figures for the corresponding period of the two preceding years were $99,000 and $108,500, respectively. That is to say, the quantity exported during the first five months of this year exceeded that for the whole of last year. The principal countries to which cement was exported during the whole of 1905 and the first four months of this year are as follows, the figures representing tons of 2,000 lbs.:—

Country.	1905.	1906.
Korea	8,954	3,215
America	199	4,952
China	3,194	1,528
Manchuria	......	1,155
Dutch India	212	327
Russia	......	252
Philippines	2 589	200
Hongkong	678	60
Straits Settlements	40	37
Australia	19	19
Canada	5,171	......
Others	66	44

The capital invested amounts to something like $2,500,000 gold. Only one company declared a 10 per cent dividend last year; most of the companies had to be satisfied with 5 per cent or less. Hitherto the situation looked a bit black. A new stage of development seems to have opened up.

IMPORTANCE OF PHILIPPINE TRADE TO THE UNITED STATES

[*The Special Tariff Committee of the American Chamber of Commerce, of Manila, the object of which organization is to interest American manufacturers, exporters and financial concerns in the efforts of the Philippine Islands to secure favorable tariff legislation at Washington, by showing them the many advantages this field would offer for trade under more beneficial and liberal tariff regulations, has just sent through the mail the following circular letter to 2,000 trade journals and manufacturers. The letter is important because it deals conservatively and accurately with the question at issue.*—EDITOR'S NOTE.]

DEAR SIR:—On January 16th, 1906, the House of Representatives of the American Congress passed what is known as "The Payne" or "Philippines Bill," by a vote of 258 to 71. The Senate Committee has thus far refused to report it. This measure provides that all Philippine products shall enter the United States free of duty with the exception of sugar, tobacco, and rice, which commodities shall pay a duty equal to 15 per cent of the regular rates. The bill further provides that after April, 1909, free trade shall obtain and be effective between the United States and the Philippine Islands, which will place the Philippine Islands on the same basis as the Hawaiian Islands and Porto Rico in their trade relations with the United States.

The reason that the date of operation of the free-trade clause of this measure has been thus fixed is found in the provisions of the Treaty of Paris, entered into between the United States and Spain, which imposes upon the Government of the United States the obligation to accord to Spain, por a period of 10 years after the ratification of the treaty, the same privileges and concessions in the trade of the Philippine Islands that she assumes for herself. Because of this provision, it would be impracticable to establish free trade until the prescribed period has expired, as foreign houses, which now control the bulk of the import trade, could, by establishing themselves in a Spanish port, without extending any reciprocal favors, obtain the same benefits as would accrue to Spain and the United States.

An additional reason for thus deferring the operation of the free-trade provision as applied to the imports of the archipelago is the present partial dependence upon customs receipts for revenue. Within the past two years the insular Government, in anticipation of the time when free trade should be established between the United States and the Philippine Islands, inaugurated an internal-revenue system similar to that of the United States, and from this source a gradually increasing amount is being realized that will, it is believed, furnish sufficient to make up what the customs revenues will lack in meeting the annual appropriations. It is generally conceded that as soon as the tariff barrier is removed the United States will furnish upward of 75 per cent of the total imports of the Islands.

Attention is called to an accompanying report of exports and imports since American occupation, with a comparison of trade in Spanish times. It shows that American influence has already proved a potent factor in stimulating business and sounds prophetic note of a wonderful rejuvenation that will be effected when free trade between the Islands and the United States is an established fact. There is no better illustration of the possibilities of the trade of the Philippines than is found by a citation of that of Porto Rico, which island has an approximate area of 3,600 square miles and a population of about 1,000,000 inhabitants. In 1901 the imports of Porto Rico were $9,366,230, the exports $8,583,967, making a total commerce of $17,950,197. *On July 25, 1901*, free trade was established between that island and the United States and has since been effective. In 1905 the imports were $16,563,259 and the exports $18,709,565, or a total commerce of $35,245,824, which nearly doubles that of 1901. The area of the Philippine Islands is placed at about 115,000 square miles, or more than 30 times that of Porto Rico. The population is seven times as great. The soil is just as rich as that of Porto Rico and the articles that make up the bulk of Porto Rico's exports are also successfully produced, or can be, in the Philippines. And in addition to such products there is grown in the Philippine Islands Manila hemp, which is peculiar to the Islands and now constitutes two-thirds of the total exports. They are also destined to be a great rubber-producing country, for on many islands of the group rubber trees of the best varieties will grow to perfection. It is reasonable, then, to assume that the Philippines can be brought to produce as much *per capita* as is now shown by Porto Rico, which, it is claimed by competent authorities, is not yet producing one-half what she is capable of with her present population. The commerce of the Philippines for 1905 amounted to $63,505,324. If it were as great *per capita* as that of Porto Rico it would have amounted to $246,720,768—more than four times what it is to-day. Free trade with the United States is the only thing required to bring the country up to a measure of production necessary to create this commerce, and with reciprocal trade relations, such as are provided in the pending bill, this great growth will be accomplished within a very few years.

While it is true that the benefits that will be the part of the people of the Philippine Islands will be great as a result of the passage of this bill, it is also true that the United States will receive vast benefits, the basis for the calculation of which may be found in the figures here presented.

The possibilities here are wonderful, and all that is needed to realize them—to make of them a reality—is money and ability; the one to provide modern implements and equipment and the other an intelligent direction of labor. As soon as these requisites are furnished and the development of the country is fairly entered into, the worth and wage of labor will be advanced in line with natural principles, and the consuming power of the people will be increased in proportion. The basis of the wealth of the country is agriculture, and thus the imports will always be made up largely of manufactured articles. The consumption of imported goods is, therefore, certain to increase in an added proportion, for as the man's earning power is increased, the surplus naturally goes to purchase things that he would use and wear, as the consumption of ordinary food products would not be increased in equal proportion with the increased wage.

But this is not all that is possible: The markets of the Orient are now being exploited. England has her basis in Hongkong, which has grown to be one of the largest shipping ports in the world. The United States will have her basis in Manila, and it is from this point that her merchants and manufacturers will naturally operate in their fight for the vast trade that is coming with the development of China and contiguous countries.

The passage of the Payne Bill by Congress will do more than any other thing to secure to the United States an advantage in Oriental markets.

We naturally feel that, if the business men of the United States will study this question, they will become interested; and after they become interested, we want them to demonstrate that interest by using their influence upon the Senators from their respective States to force early and favorable consideration of the bill that is now hung up in the Senate Committee. The direct appeal of a constituent, especially if he be a business man of weight and standing, will prove very effective with a Senator, where a communication from a commercial body from across the ocean would receive no consideration whatever. It is for this reason that we are addressing you. We want to enlist your coöperation and we earnestly request that you take this matter up without delay with the two Senators from your State and obtain from them, if possible, an expression of their attitude on this measure. *If it be not favorable endeavor to make it so.*

And beyond the commercial aspect of the case is the great question of justice to a nation of 7,000,000 of people who are economically as well as politically dependent upon the Government of the United States.

No appeal to the magnanimity, to the justice, or to the honor of American people has ever long been left unanswered and it is with confidence born of this knowledge that we commend this letter to your serious consideration.—Yours, very truly, (Signed)—HAROLD W. PITT, Chairman Committee.

Annual average of imports into the Philippine Islands for the five years 1890-94, inclusive, which covers the last period under Spanish rule of which authentic record is available:

Total.	From the United States.	
	Amount.	Per cent.
₱23,948,595	₱739,455	3

NOTE.—The average value of the Spanish or Mexican peso during the period 1890-94 was 68 cents, United States currency.

Commerce of the Philippine Islands during seven years of American occupation, 1899-1905, inclusive:—

[Exclusive of gold and silver and United States Government supplies.]

Year.	Imports.			Exports.
	Total.	From the U. S.		
		Amount.	Per cent.	
1899	$19,19[illegible],986	$1,353,086	7	$14,846,582
1900	24,863,779	2,153,198	9	22,990,373
1901	30,162,471	3,534,255	12	24,503,353
1902	33,342,166	4,153,174	13	28,671,904
1903	33,811,384	3,837,100	11⅓	32,396,746
1904	29,577,731	5,098,820	17	29,149,500
1905	30,050,550	5,589,946	19	33,454,774

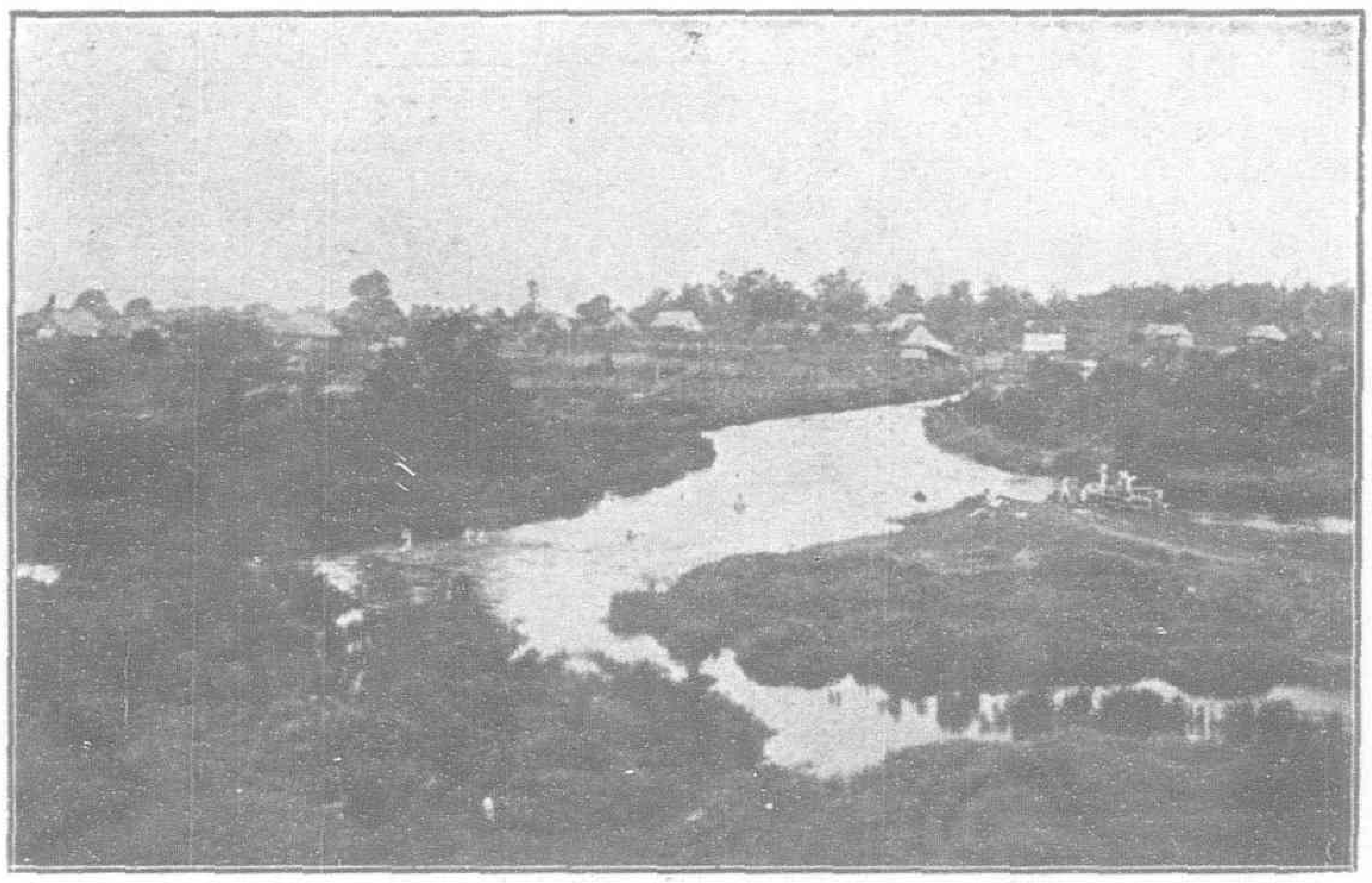
In 1894 imports from the United States amounted in value to 727,210 pesos of which petroleum represented 426,755 pesos and wheat flour 249,455 pesos, leaving but 51,000 pesos, of other products that were imported from the United States in that year. And this is a fair representation of the amount of Philippine trade American houses controlled prior to the occupation in 1898.

PACIFIC MAIL SS. COMPANY

The report of the Pacific Mail Steamship Company, of which Mr. E. H. Harriman is president, and which operates vessels between San Francisco and the Orient and to Mexico, has just been issued for the year ending April 30th, and shows a slight decrease in gross earnings. The decrease is estimated at $51,441, while the surplus has decreased $142,772. The company has a capital of $20,000,000 and has as yet paid no dividends. President Harriman gives some explanation of the report in his report to the stockholders:—"The delay in the publication of the report is due to the fact that the transactions for the months of March and April had to be ascertained from connecting lines whose offices and records were not destroyed in the San Francisco fire. The company was fortunate in saving the Pacific Mail dock and the two new piers. The schedule of sailing was only temporarily disturbed, and was resumed within two weeks after the fire. The loss by the fire to property and accounts is estimated at $148,547. In the future some of this loss may be recovered, but it has been thought best to write the entire amount against the year's income. Operations of steamers decreased about 1.43 per cent during the year, the reasons for this being a diminution of the traffic following the cessation of hostilities between Russia and Japan; the opening of service by the Toyo Kisen Kaisha; the opening of additional competitive lines; the Chinese boycott of American goods, and the traffic loss incident to the San Francisco fire. The increase of 13.19 per cent of expenses for the operation of steamers resulted principally from an increase of traffic on the Isthmus of Panama. The sum of $397,550 was credited to the fund for depreciation and general and extraordinary repairs to steamers, and charged to the year's expenses. At the close of the year a credit of $1,444,222 remained to the funds. During the year the indebtedness to the Southern Pacific Company was reduced to $82,762, from $617,122 at the beginning of the year. With the exception of this debt the company is free from floating debt other than for current expenses."

Hydro-Electric Power in the Lanao District, Moro Province

Owing to the constantly increasing wagon-train and pack-mule traffic over the Malabang-Lake Lanao and the Overton-Lake Lanao roads in the Island of Mindanao, P. I., occasioned by military construction of permanent posts, the War Department at Washington has revived the old project of constructing either a steam or electric railway to handle the transportation. As an economic measure it is believed that better transportation facilities will result in an immense financial saving to the Government every year, while at the same time a railway would materially develop the immense timber and agricultural resources in the Lanao District of the Moro Province, which is located in Mindanao and probably is the richest section of the province.



HEADWATERS OF THE MALABANG RIVER

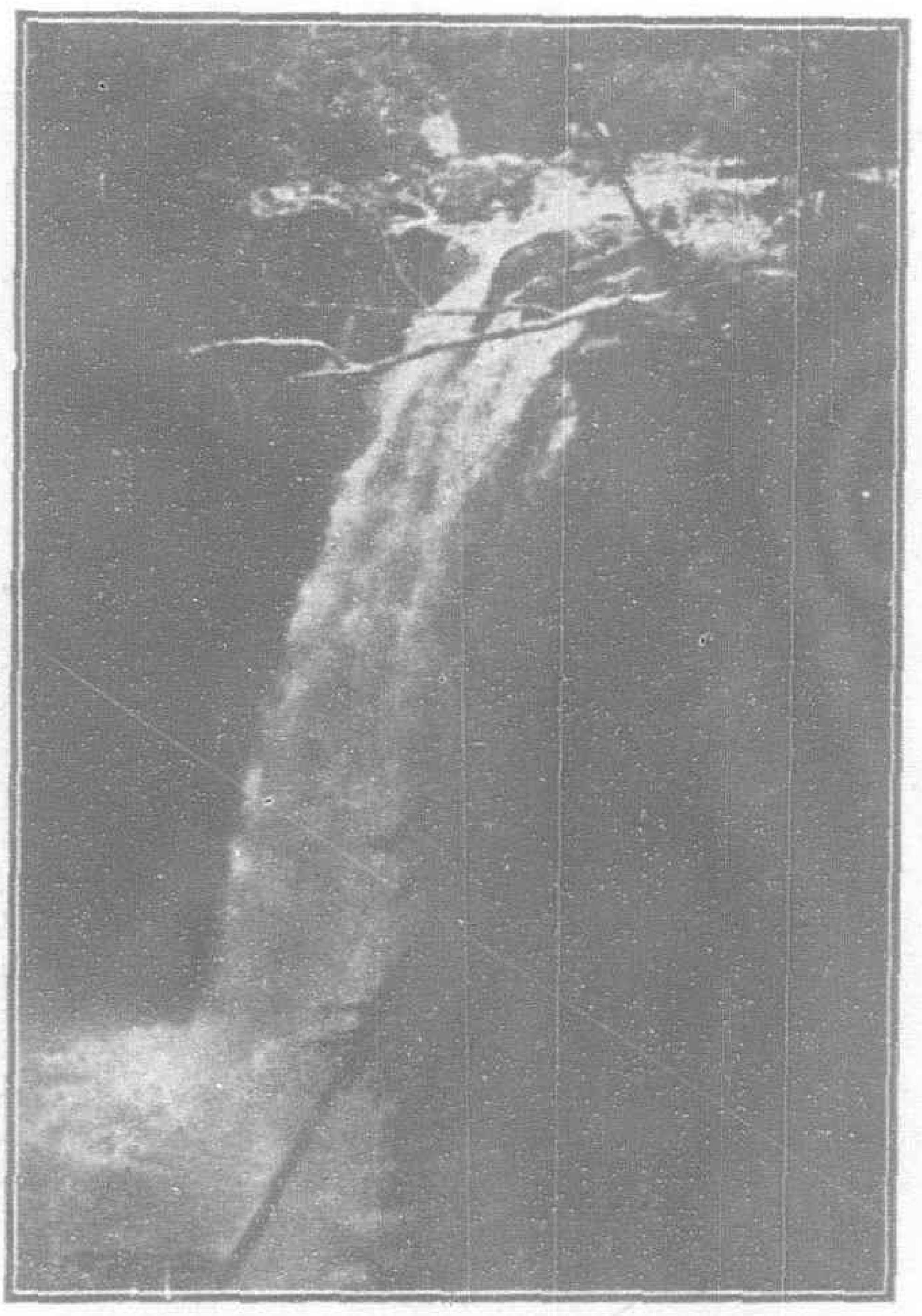
SCENE ON THE UPPER MALABANG RIVER

The grades on both the Malabang-Lake Lanao and the Overton-Lake Lanao roads, especially the former, are very heavy, and render freighting by wagon and pack-mule extremely expensive. The average load for a 6-mule team probably does not at present exceed 2,000 lbs. on either road, and that for a pack-mule is comparatively insignificant. Fully realizing the importance of overcoming the present transportation difficulties, therefore, the Government has secured surveys for both steam and electric railroads, connecting Camp Overton and Camp Keithley. Such a road would be about 21 miles long, and it is estimated that a steam road of 3' gauge with a maximum grade of 4 per cent could be built, not including contractor's profits, for from $350,000 to $400,000 gold. This road could easily handle in one day with a single locomotive what the present wagon-trains handle in 10 days.

RAILWAY AS A COMMERCIAL VENTURE.—As a commercial venture, it is believed that the railway would soon be a paying investment. It would handle all Government supplies for the various Lake Lanao military posts, and the native products which are now brought down to market by pack-ponies or cargadores. The country is well timbered, the rainfall abundant, and the valley of the Agusan River, through which the line would run, is wonderfully fertile, tobacco, hemp, rice and coffee, all growing luxuriously with most indifferent cultivation. In addition the paper-making industry with cogon and other grasses would be ready-made and of unlimited possibilities with the opening up of the country. If the line is built by private capital, surveys show that the north terminus should be Quinalang Cove, four miles east of the town of Iligan, which is an excellent harbor, well sheltered and of ample depth. This extension would open up the great plain bordering Iligan Bay, which is admirably located and adapted for cocoanut cultivation. In time the road might be extended around Lake Lanao and south to Parang, which also has an admirable harbor.

STEAM VS. ELECTRICITY.—The question of steam or electric power for the road must, according to Government engineers, be carefully considered. If it is built by the War Department, steam should be used on account of the lower first cost and simplicity. If a commercial concern takes hold of the work with capital both to build the road and develop the country, electricity will undoubtedly be the most economical, and the following facts as to water-power are to be noted:—

The Agusan River rises in Lake Lanao 2,300' above the sea-level, and after a torrential course of 21 miles empties into Iligan Bay. At two miles from the mouth of the river, there is a vertical drop of 220'. The flow of the river at the time it was gauged by engineers was 5,800 cubic feet per second, and from inquiries among the inhabitants and consideration of the steadying effect caused by the storage capacity of the lake, it is believed that the minimum flow would not be less than 2,000 cubic feet per second. This would give 5,000 theoretical horse-power. Assuming the efficiency of the hydraulic apparatus at 70 per cent and that of the electric generator at 95 per cent, 32,250 electric horse-power would be delivered to the line even in the most prolonged dry season.



MATALING FALLS OF THE MALABANG RIVER

At many other points in the river the fall is either vertical or rapid, and a large amount of power could be developed by the construction of a comparatively short length of alteral canal or flume. At present at least 500,000 theoretical horse-power, even during extreme low water, are being wasted between Lake Lanao and Iligan Bay. By using high voltage and small wires, this power could be efficiently and economically transmitted to points within a radius of 100 miles, and would be of inestimable value in future manufacturing development. In addition to the Agusan River, there are many other streams in the Island of Mindanao, particularly in the Lanao District, where water-power could be easily developed. On the south side of the lake, the Mataling Falls of the Malabang River are capable of supplying water-power to the entire southern half of the district.

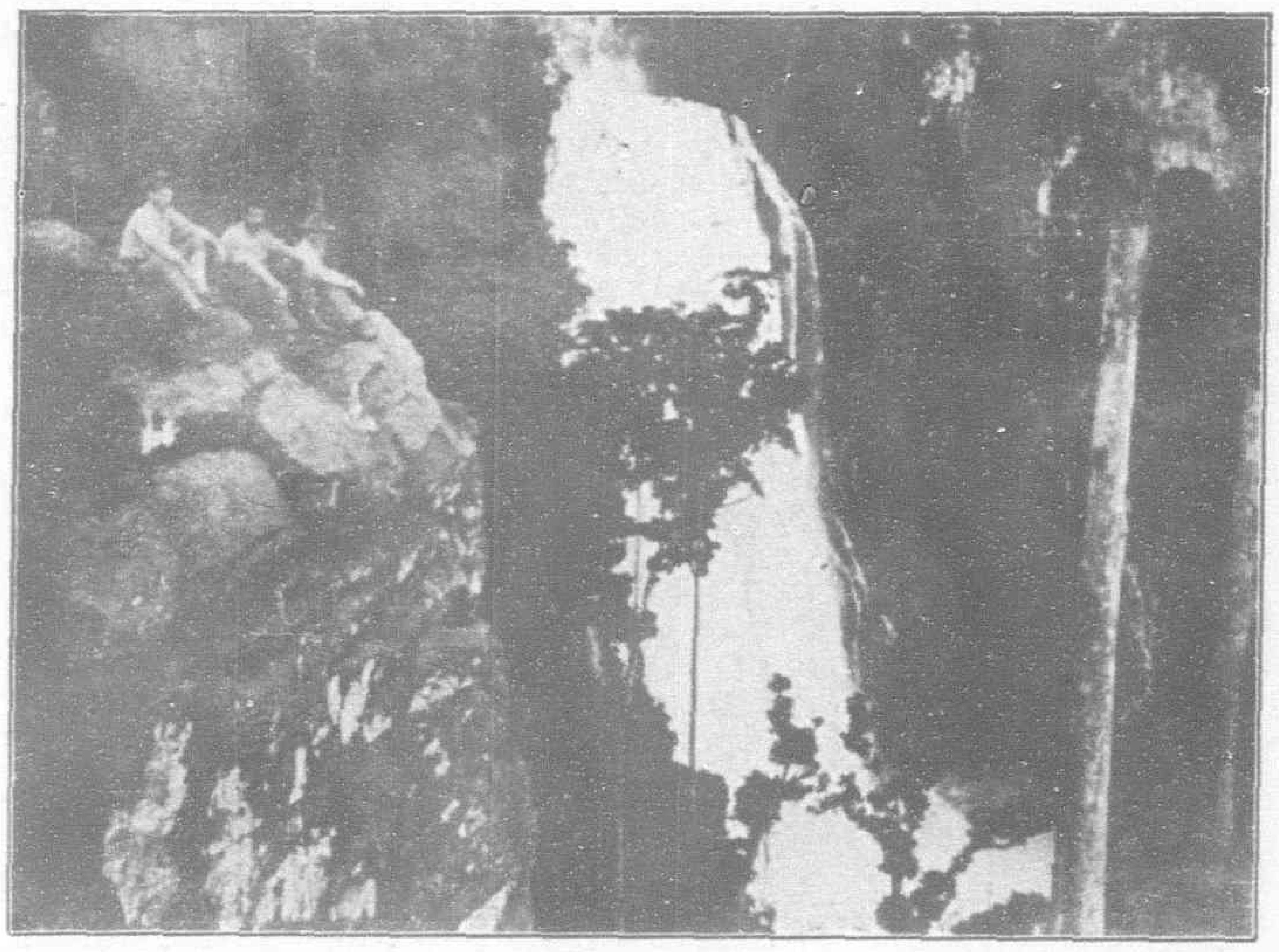
MINING IN FORMOSA

Under the new Formosan mining regulations, now in effect, corporations composed of foreign stockholders, incorporated under the laws of Japan, may hold mining property in Formosa.

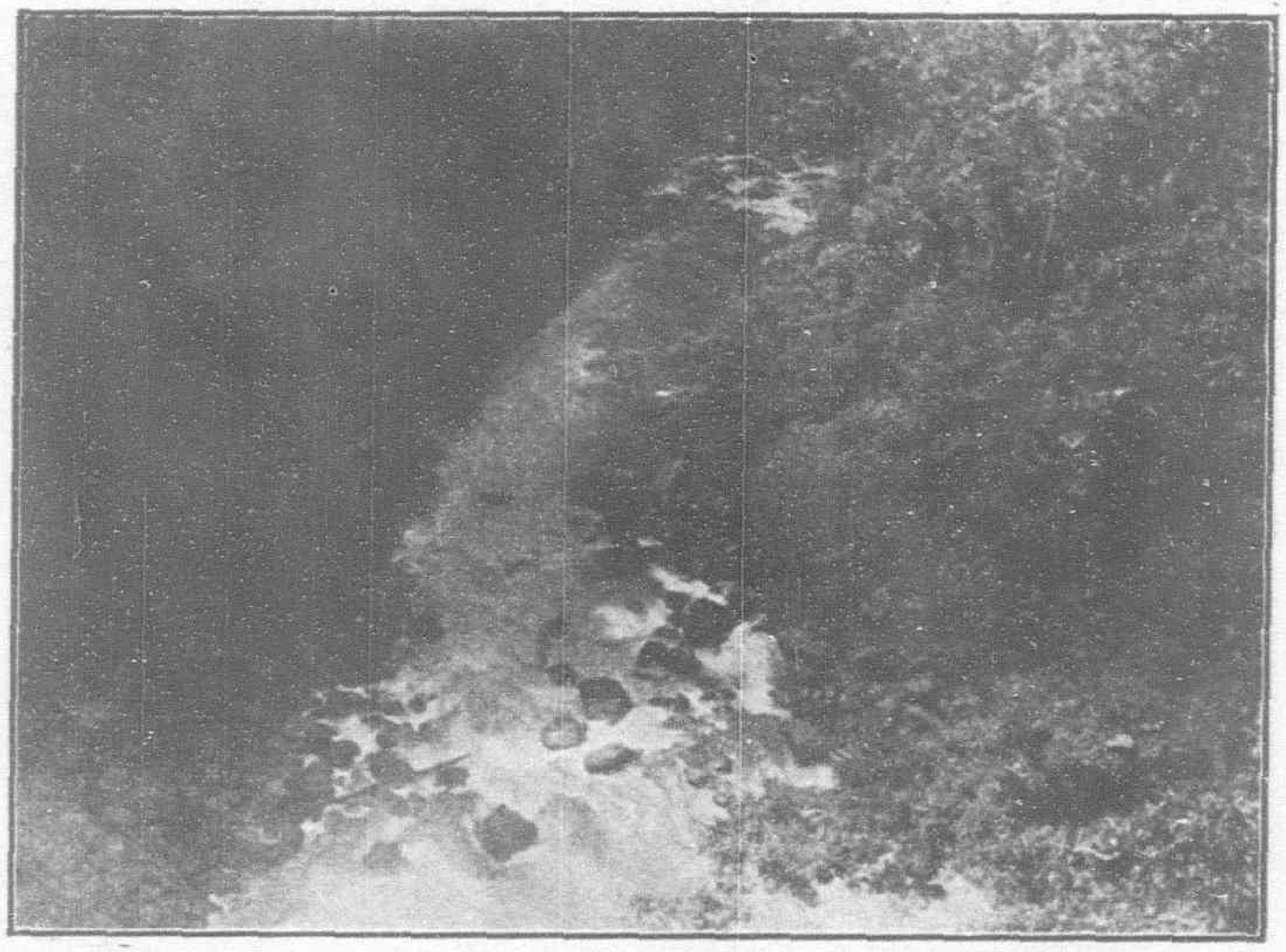
The production of minerals in Formosa, with the exception of petroleum, which is insignificant, during 1905 was 47,341 ozs. of quartz gold, 3,050 ozs. of placer gold, 94,216 tons of coal, and 1,121 tons of sulphur. These minerals are produced in the mountainous regions of the northern and north-eastern parts of the island. The sulphur is found to the north of Taihoku; the coal district lies to the east of the sulphur district, and the gold quartz and placer districts lie to the east of the coal district, to the south-east of Kilung. Coal has also been found to the south of Taihoku, near the village of Sintiam, and gold is known to exist in the northern parts and along the east coast of the savage districts of the north.

The production of gold from quartz has nearly doubled since 1902, while the production from placer diggings has nearly ceased. The quartz production is from the mines of the three Japanese companies, who reduce the ore by Blake crushers and Huntington rolls, and the separation is by the cyanide and quicksilver processes. The ore is of a siliceous nature, and contains a small percentage of antimony; its average value is from $8 to $10 gold per ton.

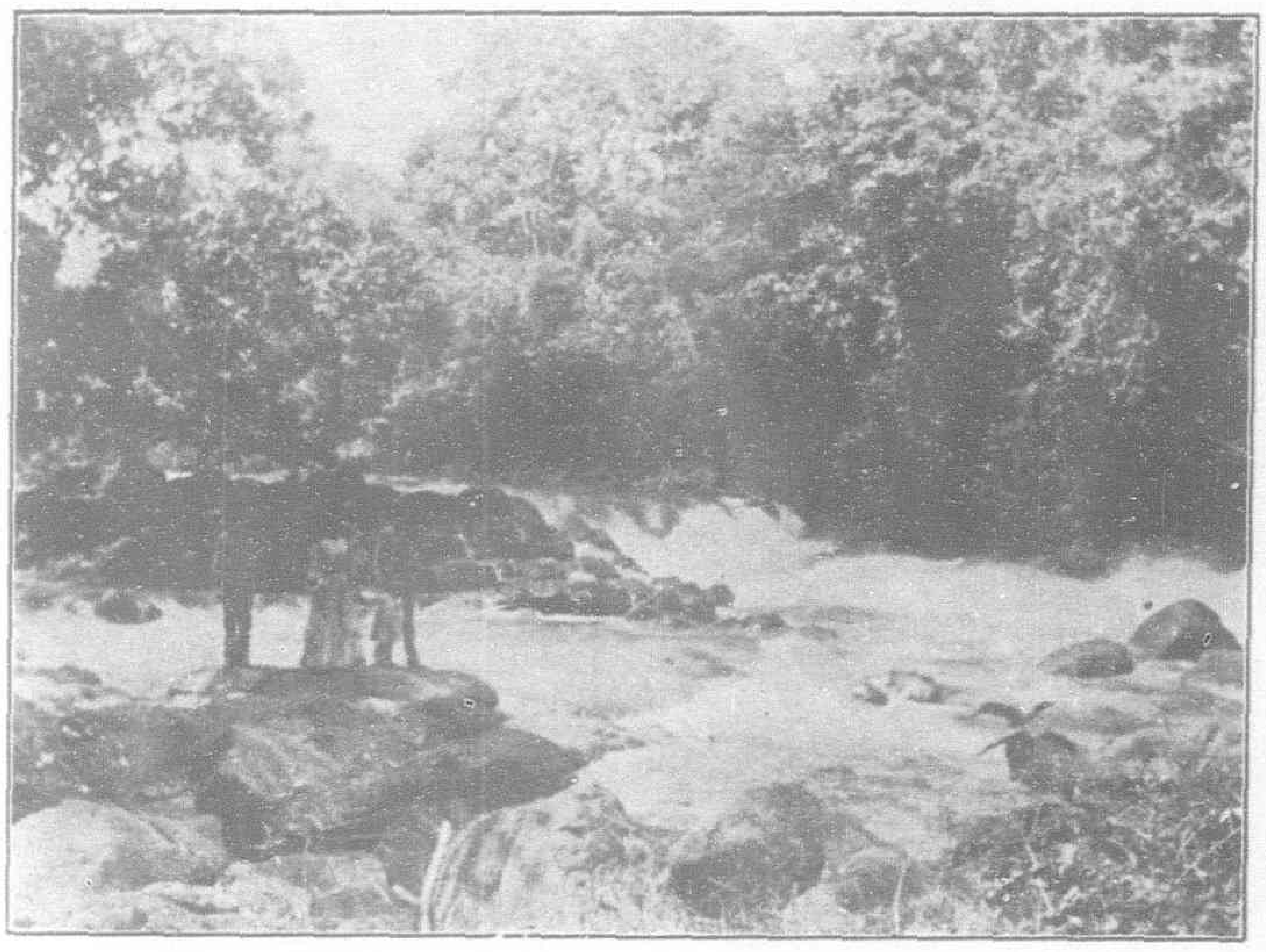
The quality of Formosa coal compares favorably with the softer Japanese coals. The seams are narrow and highly faulted, and the strata in the region in which coal is found is badly broken by upheavals. It is not probable that extensive undertakings in coal mining in Formosa would be profitable. Coal is obtained chiefly from hand diggings near the surface by natives.



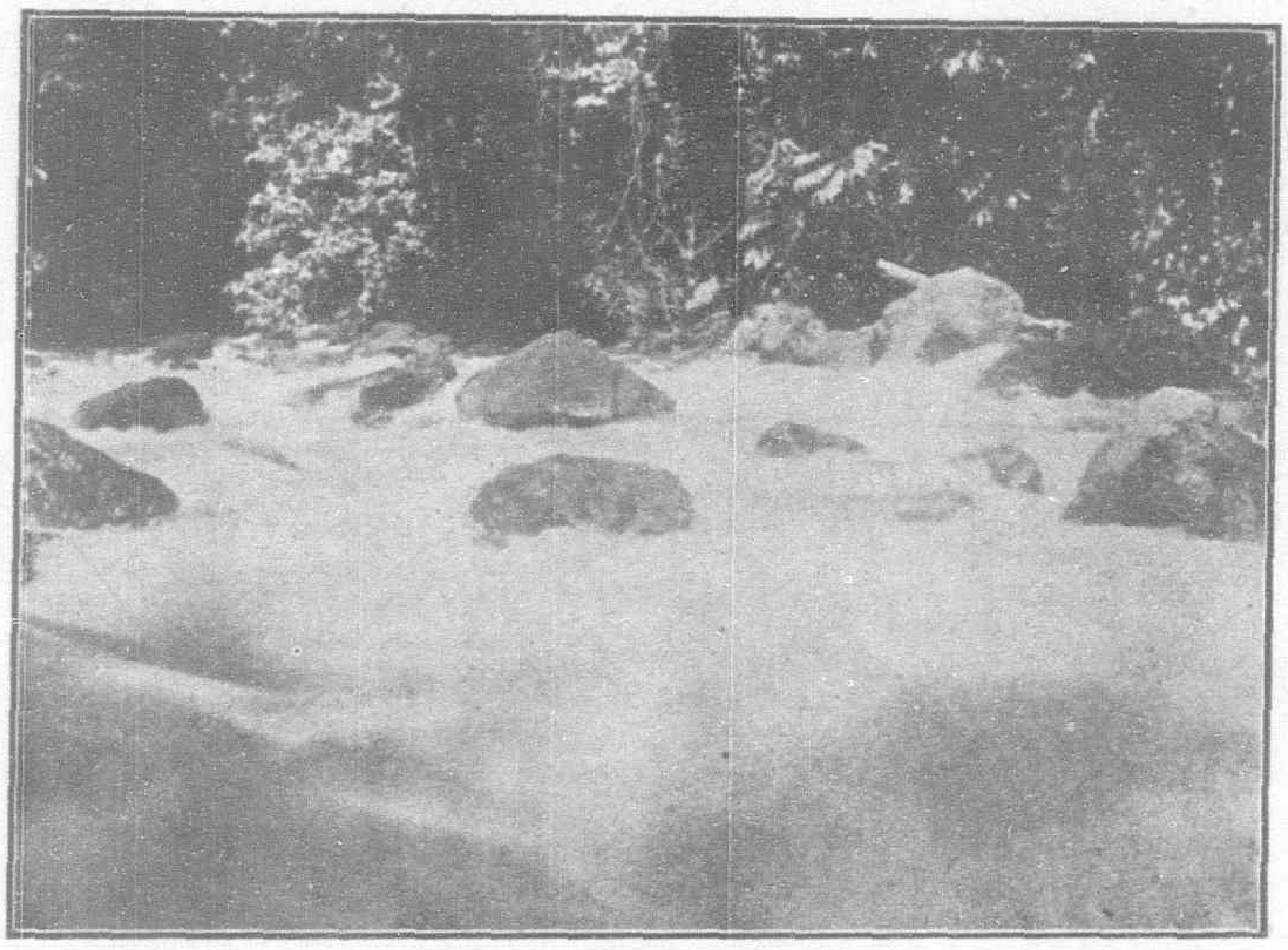
MARIA CRISTINA FALLS, AGUSAN RIVER; HEIGHT 197′, WIDTH 75 TO 100′ AT TOP, ACCORDING TO SEASON. THE WATER FALLS STRAIGHT DOWN WITHOUT A BREAK



VIEW FROM TOP OF FALLS TO THE RIVER BELOW. THE FALLS ARE ENCLOSED ON BOTH SIDES BY ALMOST PERPENDICULAR ROCK WALLS 200′ HIGH

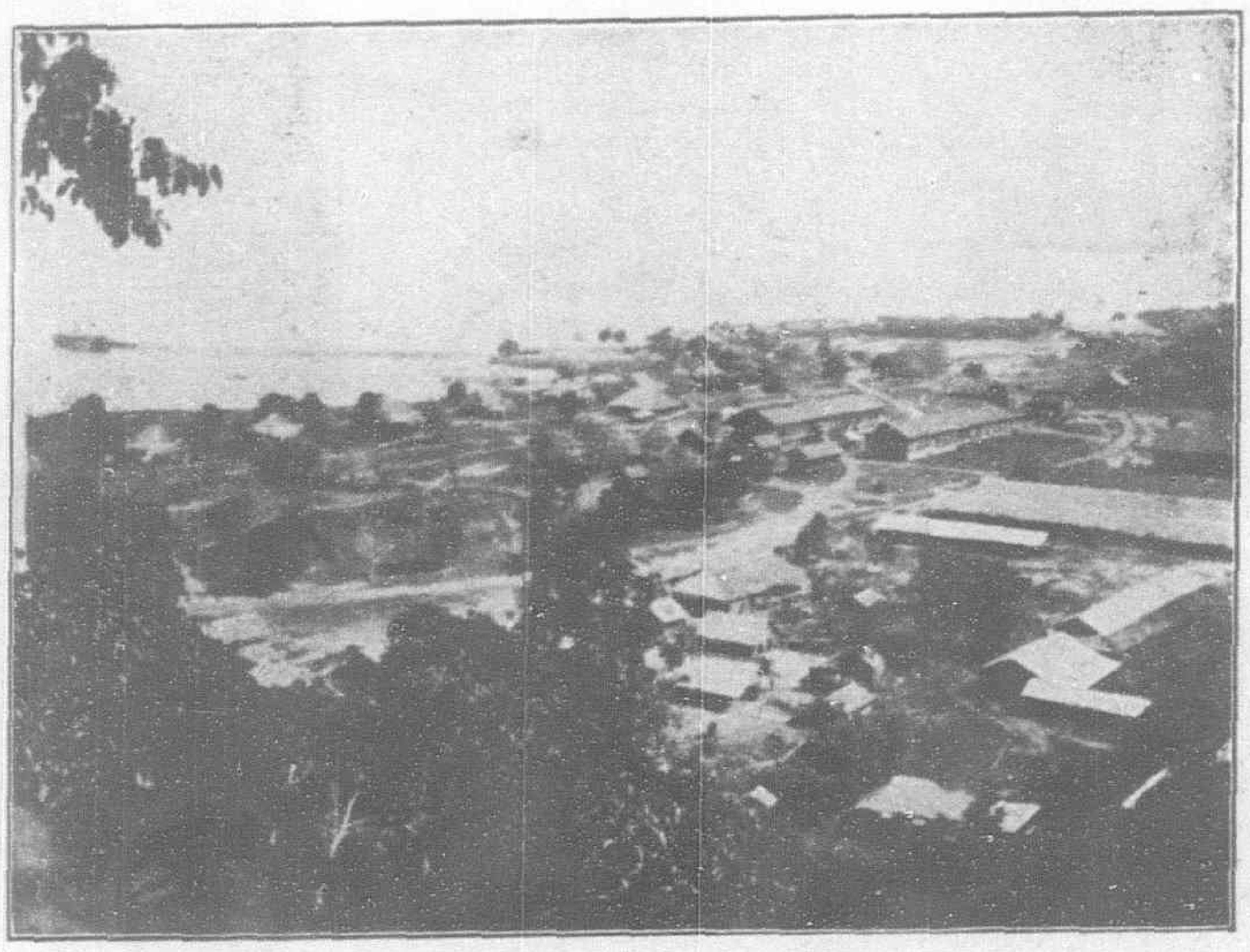


AGUSAN RIVER ABOUT ONE MILE ABOVE THE FALLS. THE RIVER HAS A DROP OF 2,400′ FROM LAKE LANAO TO ILIGAN BAY (DISTANCE ABOUT 22 MILES)

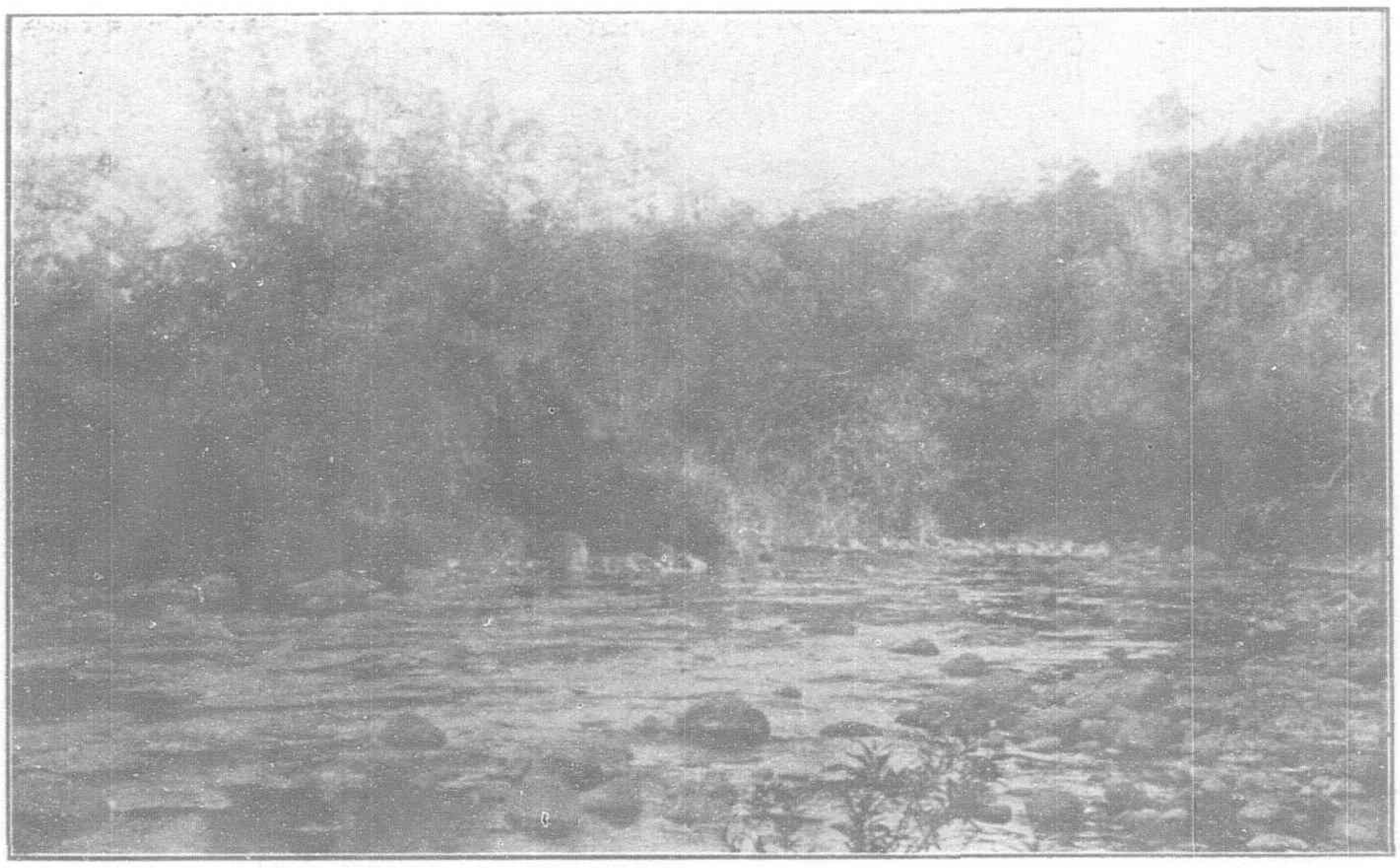


AN ESPECIALLY SWIFT CURRENT IS SHOWN HERE—ABOUT 30 MILES PER HOUR, ACCORDING TO A "LOG" TAKEN WITH A PIECE OF WOOD AND STOP-WATCH

LEVEL STRETCH OF THE AGUSAN RIVER, GIVING SOME IDEA OF THE TIMBER GROWTH ALONG THE BANKS



BIRD'S-EYE VIEW OF OVERTON, ON ILIGAN BAY, THE FUTURE IMPORTANCE OF WHICH PLACE DEPENDS UPON DEVELOPMENT OF THE COUNTRY



HEADWATERS OF THE GREAT AGUSAN RIVER

KRIAN CANAL, STRAITS SETTLEMENTS

Krian irrigation canal, recently completed in the Straits Settlements after 10 years of active work, is now in operation. The works consist of a reservoir of an area of 10 square miles, which holds approximately 14,077,500,000 cubic feet of water. The spill weir is 635′ in length and is capable of discharging about 18,000 cubic feet per second, or 6,750,000 galls. per minute. The head sluices put 1,620 cubic feet per second, or about 233,000 galls. per minute, into the main canal. The scouring sluices will pass over 2,000 cubic feet per second, or 750,000 galls. per minute. The object of the scouring sluices is to keep clear of silt the channel in front of the head sluices, so that only clear water goes down the canals. Branches leave the main canal at the three-fourth mile, the fourth mile, and the 15th mile. From the headworks to the sea outfall the canal is 21 miles long. The total length of canals is about 36 miles. The distributary channels have an approximate length of 140 miles. The canal descends 29′ to pass under the Kuran River through rows of wrought-steel pipes, the length of the pipes being 247′. The canal rises again beyond the river to resume its course. During a flood there is 24′ of water in the river flowing over the canal, which flows through its pipes beneath. The canal and distributaries are intended to irrigate some 70,000 acres of land, and also supply the district with wholesome drinking water. The project was practically abandoned twice and would have failed but for the persistent efforts of its friends, aided by Sir Frank Swettenham, former Governor of the Straits Settlements, and Sir John Anderson, Governor, who had faith in its practicability. A large area of fertile land will be opened up, the inhabitants of which for many years have suffered much from famine and epidemic disease. It is expected that crops will now be assured, the people enabled to build permanent homes, and rice mills established to take care of the crops for which this country is peculiarly adapted.

MINING RIGHTS IN SHANSI, CHINA

According to the *North-China Daily News*, there has recently been a time of considerable excitement in the capital of the Province of Shansi. For a considerable period there has been great dissatisfaction with the Government for having granted mining rights in this province to the British corporation known as the Peking Syndicate, Ltd. An impression got abroad that a monopoly of mining rights in the province had been given to this company and that even natives would not be permitted to work their own coal mines, but must perforce yield their property to the foreign speculator. In the early part of 1906 the students from this province now studying in Japan appointed one of their number to return to China and attempt to influence their home Government against granting the rights sought for by the Syndicate. On the eve of his departure from Japan the young man delegated to this work learned by a telegram from Peking that the Foreign Office had already conceded the rights asked for by the foreign firm. In despair of accomplishing the task assigned him the student, after the manner of Chen Tien-hwa who drowned himself as a protest against the Japanese proposed restrictions on Chinese students residing in Japan, cast himself into the sea. News of this event having been received in Taiyuanfu the students in the city, to the number of 2,000, gathered in mass meetings and for three days discussed ways and means of carrying to a successful issue the protest to emphasize which one of their number had just given his life. A great funeral ceremony was held in memory of the aforesaid student, and his action was so lauded as a glorious example, that it seemed at one time as if the whole 2,000 students might at one fell stroke commit suicide. The first proposal made at the mass meeting was that they should declare their opposition to the Government even to the extent of rebellion and civil war. This was, however, shelved as being impracticable. The second proposal was that all should abandon their studies and return to their homes in the various prefectures throughout the province, and there organize public meetings to arouse popular antagonism against the Government for weakly granting a concession to the Syndicate: also to collect subscriptions and buy back the land already purchased by the company. The Governor visited the various colleges and urged the students to return to their studies. The principal of the Government University expostulated with the students of that institution and pointed out that as they had no exact knowledge as to what were the terms of the concessions granted to the foreign Syndicate by the Government, they ought not to act hastily and risk bringing calamity on themselves and their provinces. In the end wiser counsels prevailed. Work in the different colleges is now going on as usual, but there is a good deal of suppressed excitement in the atmosphere.

AMERICANS AFTER CHINA GOLD MINES

Vernacular papers at Peking say that the American minister at Peking recently called on Prince Ching in behalf of an American engineer, and informed the prince that some Russians had long ago discovered two gold mines at Foochow, in the Province of Fengtien, covering about 100 square miles, which they had bought from the native owners. These mines were subsequently purchased by a representative of an American mining company from the Russians. The American company's engineer had since surveyed the district and made favorable report on the same. The company is willing to allow China to open any one of these two mines she chooses, and to supply two sets of machinery, one for itself and the other to China free of charge. The company further offers to give China, in the form of the usual royalty, half of the output from its own mine and to establish a mining school for Chinese students. China may send her engineers or students to the company's mine to learn mining science or to make inquiries. In the event of China wishing to divert the funds allowed for the establishment of the mining school, as suggested above, to other purposes, she is at liberty to do so. The engineer has expressed his opinion that these terms are very favorable to China. Prince Ching has directed the engineer in question to consult with the Military Government of Fengtien, but that official insists on hearing from the Waiwupu at Peking before he will give permission to work the mines.

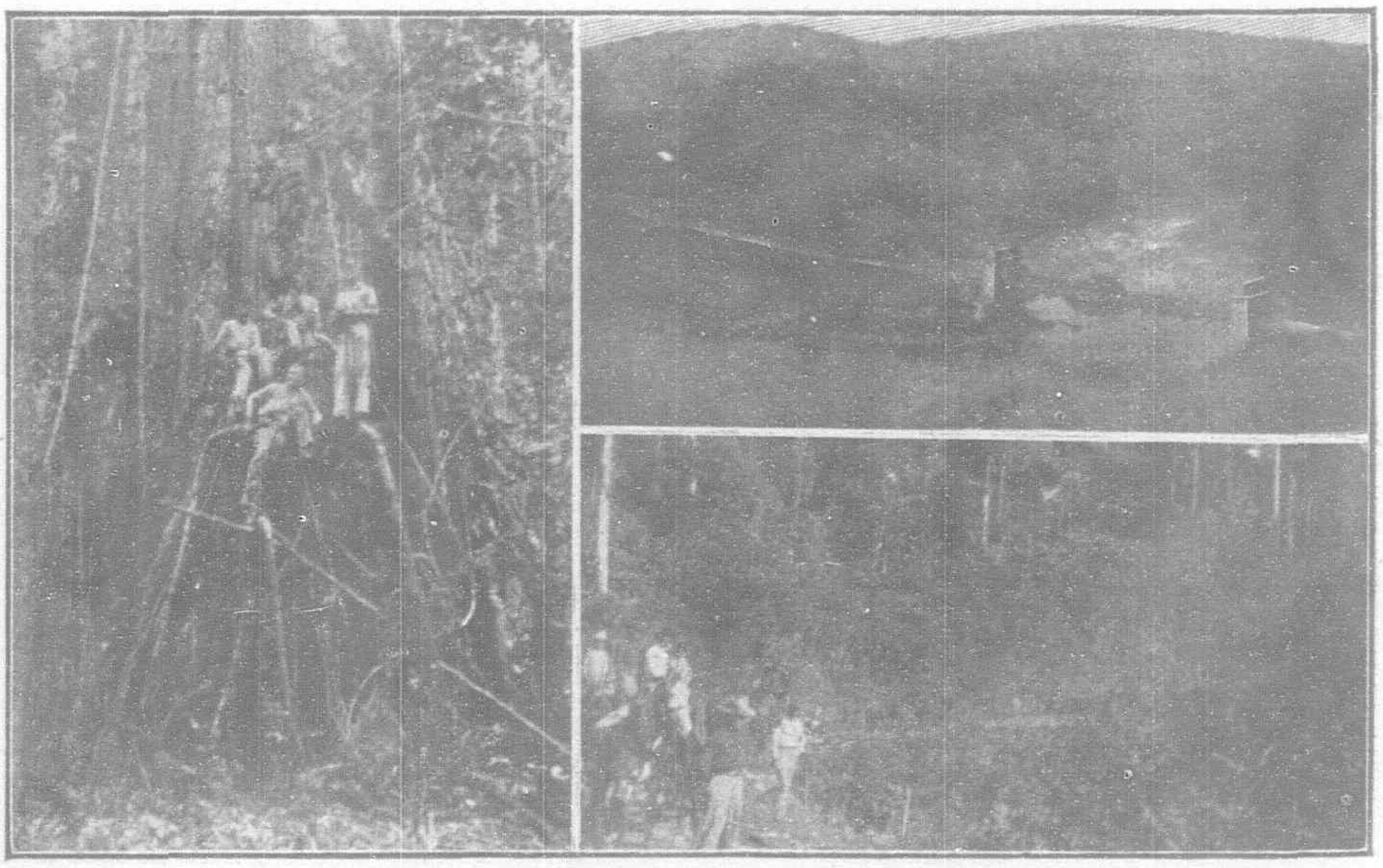
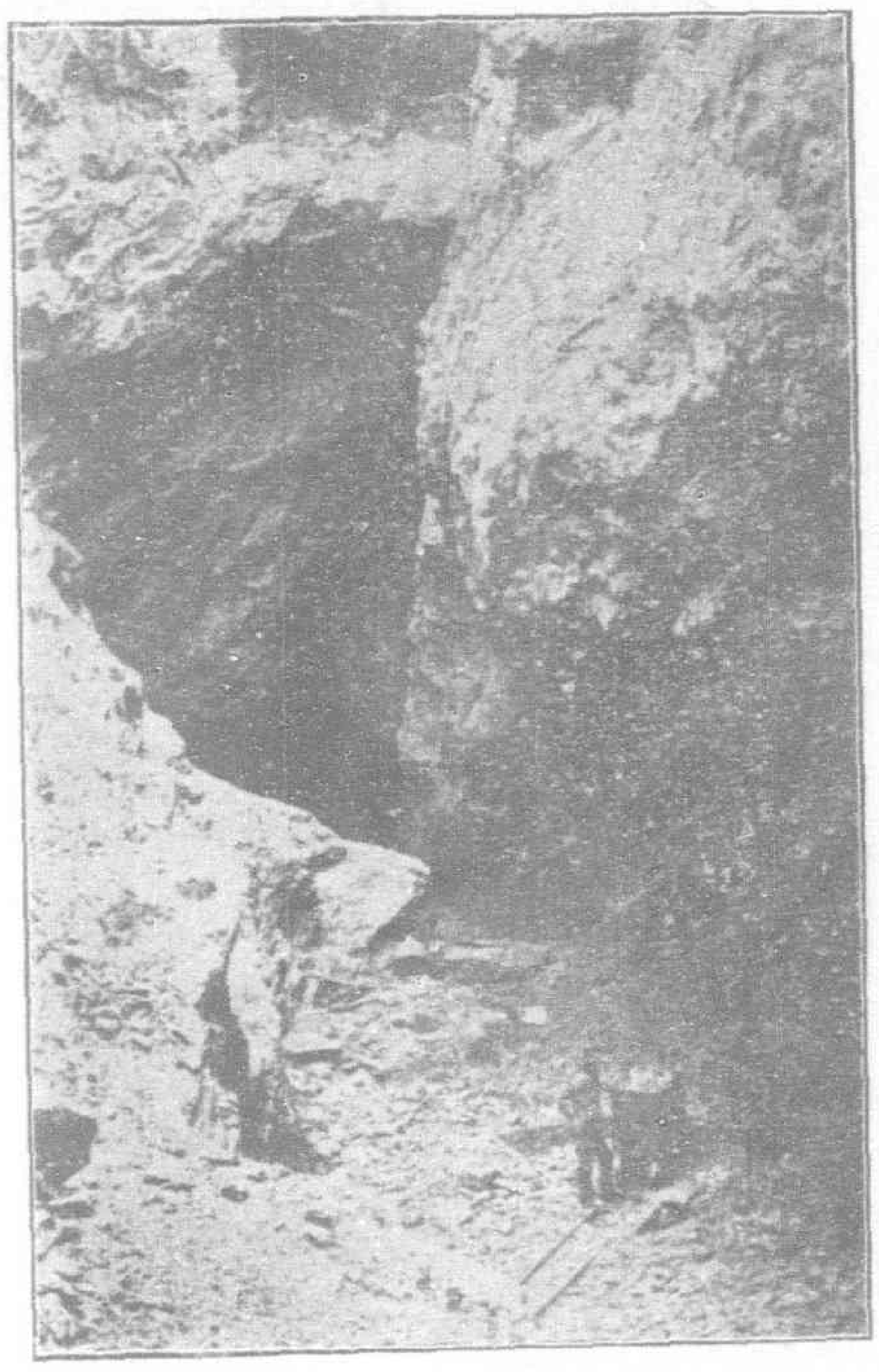


ILLUSTRATION OF THE WONDERFUL GROWTH OF TREES IN THE NEIGHBORHOOD OF MARIA CRISTINA FALLS; ALL ROOTS CENTER IN ONE TREE ABOVE. OLD SPANISH SUSPENSION BRIDGE OVER THE AGUSAN RIVER, AT PANTAR; SPAN, WITH APPROACHES, 175′ LONG. GOVERNMENT PRISONERS, WITH OVERSEERS, RETURNING TO OVERTON FROM WORK ON THE ILIGAN-LAKE LANAO ROAD

GOLD-MINING, WESTERN AUSTRALIA

Gold is still to be found in abundance in Western Australia and constitutes the state's chief source of wealth. Since 1891, when practically the first discovery was made, there has been a constantly increasing output, with the exception of 1900, 1904, and 1905, when the yield fell slightly below that of preceding years.



OPEN CUT OF AN AUSTRALIAN GOLD-MINE

Prior to 1898 the entire production amounted to approximately $24,000,000 gold, but in that year work was begun in earnest, with the result that in the succeeding 12 months over $20,000,000 was taken out. In 1901 the sterling value of the gold mines was £6,719,881 ($29,702,301); in 1902, £7,609,149 ($37,029,924); in 1903, £8,335,579 ($40,565,096); in 1904, £8,129,456 ($39,562,008); in 1905, £7,818,612 ($38,054,142); and up to May 31st of this year the yield amounted to £3,044,275 ($14,814,964). For purposes of comparison, and to show the position which Western Australia occupies in the world as a gold-producing state, the figures of 1904, showing the yield in ounces of Western Australia, Australasia, the United States, and the Transvaal, are given:

	Ozs.
Western Australia	1,983,230
Australasia	4,230,774
United States	4,090,532
Transvaal	3,773,517

For several years the problem of a water supply for the gold fields was most difficult to solve, for in that territory, about 400 miles from Perth, the capital of the state, there are no rivers, few natural supplies of surface water, and the rainfall is light. The vital importance of overcoming this difficulty was recognized by the state, and some idea of the magnitude of the undertaking may be formed by the cost of the construction which amounted to over $15,000,000 gold. In 1896 the premier of the state obtained the approval of the legislature to an expenditure of $12.500,000 for the provision of a supply of 5,000,000 gallons of water a day. The work was energetically pushed and brought to a successful completion in 1903. The supply, which is now regarded as adequate to the demands of the gold fields, is pumped 351 miles.

Fully 18,000 men are engaged in mining, and the wages paid are sufficiently high to induce 1st-class miners to remain permanently employed. In the gold fields the value of mining machinery in use amounts to approximately $20,000,000 gold, and there have been erected about 4,000 stamps. These figures show conclusively the splendid industry that has been built up, and all conditions now point to a continuance of the prosperous conditions.

AUSTRALIA TO EXPLOIT JAVA

The *Sydney (N. S. W.) Daily Telegraph* says that those countries popularly comprised, no matter what the location of the speaker, in the term *The East*, have been slow in learning the value of the principles of cold storage. It is only a few years since the great port of Manila was supplied with its first refrigerating chambers. Today the Dutch Colony of Java, with its population of 28,746,688 souls in the compressed area of 50,554 square miles, is still without such facilities, notwithstanding its tropical situation.

The fact that a proposal is afoot in Sydney to form a company to establish cold stores in Java is thus of peculiar interest to New South Welshmen. It bespeaks some of the aggressive business spirit, and some of the original enterprise, without which the state cannot hope to take its destined place in the trading world. The Java Cold Storage and Eastern Trading and Agency Company, Limited, of which the prospectus has just been issued, has a capital of £50,000 in £1 shares, but it may be increased to £100,000. It has been formed for the purpose of taking over the business of Mr. Henry Roberts, of Batavia, merchant, and carrying on and developing that business in Australia and the East. Mr. Roberts finds that in order to take full advantage of the business presenting itself it is absolutely necessary to have a head office in Australia, and, there being no cold storage in Java, also to have additional capital to provide such accommodation whereby the export of produce, live stock, frozen meat, pork, butter, etc., from Australia may be promoted and increased. The vendor holds under lease large and commodious stone-built warehouses in Batavia, which may be utilized for refrigerating rooms and general stores, so that it is anticipated no great outlay on buildings will be necessary. The present supply of meat in Java is quite inadequate, beef being retailed at from 10d to 1s 8d per lb. Diseases among native cattle having become prevalent, Java is now more than ever depending on outside sources for its meat supplies.

In addition to Java, there are in the Dutch East Indies other islands, etc., with a population which, added to that already stated, make up a total of about 36,000,000. To win a share of the trade of the whole is the aim of the company, although at first the operations will be confined to Java. In 1900 there were in the possession 75,927 Europeans (principally Dutch), and persons assimilated to them, 537,000 Chinese, 27,000 Arabs, and 17,000 other Orientals. Two years ago the natives had 7,173,918 acres of land under cultivation, while 3,519,597 acres more, making up a total of 10,693,515 acres, were tilled by the other classes of the population. Nowhere is the soil put to a more intense use or irrigation more extensively practised. Owing, however, to the prevalence of diseases the breeding of stock is restricted, and it is in that direction that Australia should be able to most profitably meet deficiencies. Some items in last year's trade between Australia and Java, expressed in money, were:—Cattle, £1,187; flour, £93,444; butter £26,533; and chemicals and manures, £11,387. Although the port is only 3775 miles from Sydney, ten times as much butter is imported from Holland as from Australia, and five times as much from Denmark. All the leather and large quantities of flour and tinned goods are received from America.

In a report which he has just furnished to his Government on the subject of the extension of business relations with Java, Mr. J. M. Sinclair, the Victorian Commercial Agent in the East, wrote that the distributing business was practically in the hands of the Chinese. Some Australian butter was imported, and he found a generally expressed opinion that if Australian butter was of uniform good quality, and properly put up, it would take the place of the Dutch product. There was a good demand for cheese, but one Victorian shipment had arrived in a worthless condition. A number of importers intended to communicate with Melbourne in regard to doing business in flour. A large trade was done in ham and bacon, which was principally imported from Holland, and at least a dozen importers had informed him that if Victorian curers would get up their hams in the same manner they would find a good market at payable prices. Small-sized hams, about 9 or 10 lbs. in weight, were preferred. A little canned fruit had been imported from Melbourne, but importers did not think they equal in quality to the Californian, and the prices were slightly higher. A number of importers also intended to negotiate with Victorian manufacturers for jam and fruit preserves. It was stated that the price of Victorian wines was too high, but two firms were doing an increasing trade in South Australian wines. People in the East were used to tropical fruits only, and would be willing, for a change, to pay fair prices for Australian fruit if it could be shipped to arrive in good condition. Mr. Sinclair also thought that if local needs were studied trade might be opened up in biscuits, condensed milk, leather belting, compressed fodder, horses for the military, and dairy cattle.

The provisional directorate of the new company is composed of Sir Francis Suttor, Senator Gould, Mr. T. Waddell, M. L. A., Mr. W. F. Jaques, Mr. E. H. Rogers, and Mr. J. Barre Johnston. It is claimed that it is the first trading company established in Australasia for the purpose of endeavoring to find new markets for Australian products in the Dutch East Indies, and the belief is expressed that the establishment of cold storage at Batavia should ensure the bulk of the trade. If so, the operations will benefit not only the pastoralists, agriculturists, and dairy farmers, but the whole community.

SOCIETY OF ENGINEERS AND ARCHITECTS OF SHANGHAI

The first meeting of the new session of The Shanghai Society of Engineers and Architects was held during the last month. Mr. John Prentice, of the Shanghai Dock and Engineering Company, Ltd., vacated the presidential chair in favor of Mr. Thomas Weir, Marine Superintendent of the China Merchants' Steam Navigation Company, who delivered an interesting address. He spoke about what Shanghai might have been, had the people known what they know now and had sufficient funds been available for the purpose. He related some of the incidents connected with his long service with the China Merchants' Steam Navigation Company, and dealt particularly with the difficulties encountered by engineers not so fortunate as to be connected with schemes from their inception, citing particularly the instance of the steamer *Haean* which originally had large paddlewheels, American bean engine and boilers, large coal bunkers and very little room left for cargo, and which broke her crosshead at Tientsin. The floats were taken off the wheels and she was towed down by another steamer at a higher speed than she usually attained under her own steam, and on less coal for both steamers than she would have used had she made the trip alone. This vessel was afterwards converted into a screw steamer and refitted, and became one of the fastest, most popular and profitable steamers in the company's northern trade, and is still doing good service on the Foochow line. The latter part of President Weir's address was devoted to comment on the development of engineering in Europe and America, and concluded by reminding his hearers of the debt which engineers owed to chemists, metallurgists and steelmakers for furnishing such excellent materials for engineering work. A vote of thanks was accorded to the new President for his address, which will be published in the *Proceedings of the Society*. A vote of thanks to the retiring President for his services during the past year brought the session to a close.

FAR EASTERN ENGINEERING, CONSTRUCTION, COMMERCIAL AND FINANCIAL NEWS

ELECTRIC RAILWAYS, LIGHTING, POWER, ETC.

Penang Electric Tramways.—The Penang tramways are estimated to earn *$73,000 during 1907.*

Lighting System for Foochow.—There is a movement on foot at Foochow, China, looking to the organization of an electric lighting company to supply about 5,000 lights.

Double Railway Telfgraph Line, S. S.—The Railway Department of the Government of the Federated Malay States has taken the first step towards the construction of a double telegraph line from Singapore to Penang, and the whole work will, it is estimated, be completed and the line in working order before the end of next year.

Telephone System at Bangkok.—The American Minister to Siam writes:—"The present system of telephones has proved unsatisfactory in the City of Bangkok and a change has been decided upon. The plans, specifications and estimates are now completed, having been prepared by Henry W. Wilder, of New York, and are in the hands of the Post and Telegraph Department awaiting examination preparatory to the Government appropriation necessary for the work. It is estimated that the cost will be in the neighborhood of $50,000 gold. The contract will be let by the Public Works Department. The open tender is rapidly gaining favor in Siam. It is proving most satisfactory in the Royal Railway Department, and is being applied to both army and navy contracts with good results. There is little doubt, therefore, that this contract will be let by open tender also.

Electrical Schemes in Japan.—An extensive scheme is under consideration to furnish electricity to Osaka and Kyoto. The power-house is to be established at a village about 28 miles distant from Osaka and about 8 miles from *Kyoto, where water-power* is available to the extent of over 45,000 h. p. The electrification of the Nankai Railway is in progress. The company own an interurban steam railway 40 miles long, 9½ miles of which are double track. This line taps a number of popular resorts and the traffic is increasing along with the completion of the electrification of the service, which is at present limited to the double-track section. The company's generating station is situated at Sumiyoshi, some distance outside the city of Osaka. Another scheme of electric tramways has been considered and decided upon by the Osaka City authorities, who intend to spend -Y- 22,000 000 on a complete electric tramway service for the city and district. A project for an electric railway between Osaka and Kyoto is also contemplated, the capital being £200,000. The line will run through a fairly populous district not at present provided with railway facilities. It is considered that the concessions recently granted to private enterprise for the construction of electric railways and tramways will be the last of such concessions, as the Japanese State Railway Department and the municipalities of the various cities are disposed to retain this branch of industrial enterprise in their own hands.

RAILROADS AND RAILWAY SUPPLIES

Japan's 15-Year Railway Program.—The total expenditure for carrying out the 15-year program of the railway construction and improvement of the Japanese Government is estimated at $200,000,000 gold, of which $175,000,000 are for construction and the balance for improvement work.

New Railway for Japan.—A new railroad is being built in Japan to connect the southern portion of the Island of Kyushu with the railway system of the empire. The new line involves some engineering difficulties in the spanning of a river and the construction of the Yadake Tunnel, 6,883′ long.

Yunnan (China) Railway.—Work on this now famous line is progressing. Even the enormous difficulties of the deadly Namti Valley are being overcome, according to the *South-China Morning Post.* The loss of life among the laborers is being reduced to a minimum through the medium of general health and sanitation regulations.

Hokkaido Railway Traffic.—The transport capacity of the railways in Hokkaido is reported to be inadequate to cope with the abundant agricultural crops, and the production of enormous quantities of timber and coal. The Hokkaido Government is pressing the Railway Traffic and Communications Department to adopt measures to improve the situation.

Seoul-Fusan Railway, Korea.—The repairs of this line are to cost, it is estimated, -Y-1,500,000, which appropriation having been made by the Japanese Government, work will be commenced at once. The damages that have to be made good were caused by floods and it is said that the plan of repair is calculated to avert such happenings in future. In other words, the repairs amount to about the same as reconstruction.

Chekiang Railway.—A Chinese engineer, with a staff of 14 assistants, has begun the survey of the proposed railway between Hangchow and Chiahsing, part of the Chekiang line. The work on the short line between Chiangkan, on the Tsientang River, and Kungchen Bridge, the new foreign settlement at Hangchow, is in charge of the engineer-in-chief of the Chekiang Railway, Mr. Chang K'ehming.

Canton Railway.—The Canton Railway Administration had intended to employ an American engineer recommended by Sir Cheng-tung Liang Cheng, Chinese minister at Washington, *but as the majority* of the shareholders of the railway maintained that the line having been redeemed from American concessionaires no more foreign engineers should be employed, the director-general of the railway telegraphed to the Chinese minister to cancel the offer of employing the American engineer.

South Manchurian Railway's Northern Terminus.—Major-General Nakamura, Mr. Furukawa, the railway engineer, and Mr. Hagiwara, Japanese Consul-general at Mukden, have been appointed the Japanese commissioners for the settlement of the question of the northern terminus of the South Manchurian Railway. The Russian Government's commissioners are to be Prince Khilkoff, Vicepresident of the Chinese Eastern Railway Company, the Russian diplomatic agent at Harbin, and a third party who has not yet been appointed. There is a dispute as to whether Changchun Station shall be regarded as coming within the Japanese part of the line.

Swatow-Chowchowfu Railway.—The completed railway from Swatow to Chowchowfu, 28 miles in length and leading due north from Swatow, has been formally opened to traffic. Actually the road is not completed at the Swatow end yet, the idea being to lay the rails right to the wharves. Before this can be done, however, a creek will have to be bridged. Traffic over that portion of the line just opened is said to amount to $1,000 per day. The railway is interesting as being the first to be constructed by Chinese under Japanese engineers. It is destined to eventually connect with the Canton Hankow Railway.

Johore State Railway, Malaya.—The construction work in this line is now well in hand as far as the 40-mile post, *while from the Gemas end the progress* is even better. Rails in a short time will have reached Rentau Panjang, or 20 miles from Gemas, from which point construction work started only a little more than a year ago. Earthwork and bridges are in course of construction, right away to the Sekoe River, 50 miles from Gemas. A gap of 30 miles remains to be started on. At Suloh Kesap (12th mile), a little town has sprung up, due, it is claimed, to the large labor force which has been engaged on the building of the bridge over the Muar River, which has lately been completed. This bridge is said to be quite a handsome structure. A smaller bridge spans the Segamat River at Rentau Panjang, which also is growing apace.

Kowloon-Canton Railway.—Following is an extract of the more important points of the agreement for the loan for the proposed Kowloon-Canton Railway: —(1) The loan to be £1,500,000 guaranteed by a mortgage of the Kowloon-Canton Railway; (2) £94 to be paid for every £100; (3) interest on same to be at the rate of 5 per cent *per annum*, same to commence on date of issue of the bonds; (4) a single track to be constructed, but the roadbed to be widened so as to be prepared for the construction of a double track; (5) work on the road to be started within eight months, failing which the agreement will be annulled; (6) the head office of the proposed railway to be in Canton, the Viceroy of Kuangtung and Kuangsi to appoint a director who shall be assisted by a British engineer-in-chief and a British manager; (7) the staff of the company to receive £35,000 as remuneration during the time agreed upon for the construction of the railway, the said sum being the commission for the purchase of materials; (8) the sum of £1,000 to be paid the company each year, payment of which will cease upon repayment of the whole loan; (9) the loan to be for 50 years, interest only on same to be paid for the space of 12½ years after which both principal and interest to be paid in installments; (10) the viceroy of the Two Kuang provinces will arrange separate terms with regard to the joining together of the Canton line to that of the Kowloon line.

Sumatra States Railway.—The 1905 report of the Sumatra States Railway and the Ombilien coal mines has just been issued in Amsterdam. The length of the railway remained at 210,184 kilometres. For new works fl 76,260 was spent, so that the construction account in December, 1905, *shows an amount of* fl.21,111,079. The total working receipts were fl.1,452,023, and the total expenses fl 973,128, leaving a balance of fl.478,894. The carriage of passengers realised fl 12,000 less than in the preceding year; on the other hand, the carriage of goods total is increased by fl 18,000 for coal and fl 63,000 for other goods, so that the total receipts were fl.72.342, higher than in 1904. The increased carriage of goods is due to the import of rice, necessitated by the failure of the crop in those districts which the railway traverses, while the passenger decrease is doubtless also connected with the crop failure. The balance is larger by fl.155,477, but only fl 62,092 was paid for repairs, against fl.157,443 in 1904. The output of the Ombilien mines amounted to 221,416 tons, including 9,640 tons for own consumption—a figure not taken into account in former annual reports. Compared with the previous year, the quantity of coal forwarded from Sawab Loento showed an increase of 4,028 tons. Smaller sales at the Emma Harbor is due to the reduced requirements of the Rotterdam Lloyd and Netherlands steamers in the harbor, but the quantity rose again towards the close of the year. At that time the available stock of coal was 1,508,500 tons. Twenty foreign steamers touched at the harbor, against 22 in 1904. The number of compulsory laborers was 705, and that of contract laborers 2,415. The cost of enlisting, feeding, etc., amounted to fl 215,191, against fl.243,353 in the preceding year. The total figures of the working of the mines was fl.2,254,265. If expenses are deducted, the net amount is fl.1,047,046, for which 221,416 tons are delivered, so that the cost of working is fl 4 72, against fl.5 65 in 1904. The receipts were fl.2,470,698, including fl.1,744,567 for coal delivered to various branches of the Government service, and fl.726 131 for supplies to private persons. The latter amount is less than that of 1904, owing to a large quantity of Cardiff coal, which was destined for the Russian Navy but not taken, and by which the Indian market was for a time overstocked. The balance of the account is fl.135 892, and after writing off a profit is booked of fl.13,984. If the results of the two undertakings are combined, the profit is fl.492,897, or more than 2 10 per cent. on the invested capital of fl.23,394,510, against 1 71 per cent. in 1904 and 3.11 per cent. *in 1903.*

PUBLIC AND PORT WORKS, DOCKS, WHARVES, ETC.

Floating Dock for Kobé.—It is hoped and expected that the floating dock to be built in England for Kobé Harbor will be in position in two years.

New Russian Municipal Buildings, Tientsin.—A very handsome and convenient range of municipal offices, etc, was recently formally opened in the Russian Municipal Concession of Tientsin. These offices were erected at a minimum cost of Tls. 30,000.

Water Supply for Fusan, Korea.—The Japanese settlement at Fusan has decided to obtain a water supply. For that purpose $590,000, gold, is to be raised abroad through the agency of the Industrial Bank of Japan. The enterprise will be jointly undertaken by the Municipality of Fusan and the Korean Government.

Omuta (Japan) Harbor Works.—The work of improving the harbor accommodations at Omatu, overtaken by the firm of Messrs. Mitsui & Co., is rapidly *nearing completion, and it is anticipated* that this port will be available for shipping early in 1907. The opening of Omuta to foreign trade is predicted to result in drawing a large amount of shipping away from the neighboring ports of Misumi, Kuchinotsu and Moji.

Old Dock Property, Shanghai.—At a recent meeting of the shareholders of the Shanghai Dock and Enginering Company, Ltd., the amended resolution, carried at a previous meeting for the sale of the company's Old Dock, was confirmed by a vote of 23,238 shares against 2,723 shares. By this resolution the directors are authorized to dispose of the property known as the Old Dock, situated in Hongkew, and of part of the property situated between the Cosmopolitan and International docks, to a limited company incorporated under the Hongkong Ordinances with a capital of Tls. 1,380,000.

SHIPBUILDING AND GENERAL MARITIME MATTERS

Oil Fuel for Japanese Steamers.—Consul C. B. Harris, of Nagasaki, confirms the report that Nagasaki shipyards have contracted to build for the Toyo Kisen Kaisha (Eastern Steamship Company), of Tokyo, for use on its Hongkong-San Francisco line two sister ships, each of 13,000 tons, gross, and that the vessels will be fitted to use oil for fuel. He is also informed that that company's three vessels, the *America-maru*, *Nippon-maru* and *Hongkong maru*, each of 6 000 gross tonnage, now plying between the ports named, will be fitted to burn the same fuel.

Nippon Yusen Kaisha.—The *Japan Chronicle* says that 13 new ships are being built for the Nippon Yusen Kaisha, of which number three are under construction in England—two being vessels of 2,500 tons each, and the other of 2,000 tons. These three are intended for the Shanghai line; and five others, four of 3,500 tons each and one of 8,600 tons, are being built by Kawasaki Dockyard Company, Ltd., of Kobé. Another five ships, four of 8,600 tons each, and one of 6,500 tons, are being built at the Mitsu Bishi Yards, Nagasaki. Of the boats being built at the Kawasaki yard two, and four other ships are intended for the European line. The vessels of 3,500 tons in the hands of the Kawasaki yard are for the Yangtsze River line.

Repairs for the "Manchuria" and "Mongolia."—According to *The London and China Express*, estimates of repairs for the two vessels of the Pacific Mail Steamship Company, lately ashore, show that in the case of the *Manchuria* permanent repairs will probably cost about $300,000 gold, and those of the *Mongolia* about $150,000. A curious result of the disasters is that as both vessels are at San Francisco, and there is only one dock at the port capable of taking a steamer of their size, the *Mongolia* is being repaired temporarily so that she may be fit to resume her service until the *Manchuria's* repairs are completed. The *Manchuria* will be kept out of the service for about seven months, which, of course, involves her owners in additional heavy losses. The permanent repairs to the *Mongolia* will require about four months.

MINING, MINERALS AND THE METAL TRADE

Penang Foundry.—The creditors of penang (S. S.) Foundry have thrown the company into voluntary liquidation.

Coal in Manchuria.—Although there are abundant coal deposits in Manchuria, according to an American consular report the price of this fuel still remains abnormally high, averaging from $6 50 to $8.50 gold per ton for common grades.

NEW COPPER MINE, JAPAN.—A new copper mine has been discovered in Masutomi-mura, Kitakoma-gori, Yamanashi-ken. According to investigations made the ore contains more than 15 per cent of good copper.

JAPAN COAL COMPANY.—This company has acquired a rich coal mine recently found in the neighborhood of Mogi Harbor, Hokkaido. Within a year and a half the company expects to realize a dividend of 30 per cent on this investment.

HOKKAIDO COLLIERY AND STEAMSHIP COMPANY.—The Board of Directors of this company have decided that it engage in the manufacture of pig-iron from sand-iron abundantly found in Hokkaido. There is also a report of the company starting a steel foundry.

KURAKAWA COPPER MINE, JAPAN.—The total area of mineral lands of the Kurakawa Copper Mine, Gifu Prefecture, Japan, started by Mr. Kyugoro Suzuki, is 1,500,000 *tsubo*, and with the present provision the net profit per month amounts to -Y-100,000. A certain American capitalist has applied to Mr. Suzuki to join in the mining enterprise with -Y-400,000, and negotiations are now in progress.

FUSHAN COAL OUTPUT.—At the Fushan (Manchuria) mines, where a coal vein of 100′ in width is available, the Japanese are turning out only about 1,000 tons per day at the present. While this and other Southern Manchurian coal properties are capable of supplying coal to this part of the world, and will no doubt later figure largely in the exports of Manchuria, coal is still being imported.

MINING BOOM IN JAPAN.—With reference to the mining activity in Japan, the total number of applications for mining permits from January, 1906, to the end of September was 4,200, an increase of 2,220 as compared with the corresponding period last year. The Sapporo Mining Bureau had 889 applications for prospecting and 37 for actual mining; Sendai Mining Bureau, 763 and 47 respectively; Tokyo Mining Bureau, 627 and 27 respectively; Osaka Mining Bureau, 685 and 73 respectively, and the Fukuoka Mining Bureau, 707 and 80 respectively.

IRON WORKS, TSUCHIZAKI, JAPAN.—The work of constructing a big iron works at the Port of Tsuchizaki, Akita Prefecture, Japan, is under way. The works will not only meet the requirements of the entire O-u Railway but those of the projected U Etsu Railway. The workshops will cover 40,000 *tsubo* of land, and the length of the railways to be constructed within the compound will reach six miles. Construction will be finished in four years, but will progress in such a manner that in autumn, next year, about 500 men will be working in the shops.

JAPAN'S MINERAL DEVELOPMENT.—A plan is maturing in Japan for the establishment of metallurgical works in the District of Waki, Iwate Prefecture, which abounds in various minerals, but where metallurgy is still carried on by ancient and very inefficient methods. It is intended to utilize the Waki River and to employ water power electricity in the works. The company will have a capital of -Y-3,000,000, and all the shares have been subscribed for by the promoters and others, chief among the former being Baron Mayejami, Messrs. K. Kawasaki, B. Nagano, K. Magoshi, T. Hyakawa, S. Go, K. Ito, and Y. Nakajima.

COAL-MINING IN INDIA.—Operators in Bengal pay their coolie labor 22 cents gold per ton for mining coal, and it costs them 55 cents a ton to mine, screen, and load on cars. All of the coal of India is bituminous. Some of it is hard and glossy, and, according to an American consular report, is much like Rock Springs, Wyo., coal. Such coal retails in Calcutta at 16 cents gold per *maund* (82 lbs.). There are 27 *maunds* per ton, which would make a ton cost $4.41 gold. By purchasing a ton or more at one time the rate is from $2.08 to $2.24 per ton. The coal-fields now operated are in Bengal, the native states of Central India, and Hyderabad. A comparison of the figures officially given out will show that India is first among the coal-producing dependencies of Great Britain. As yet the coal-fields of India have scarcely been touched. They are estimated to cover 35,000 square miles. The total output during 1905 was 7,762,779 tons, and Bengal, in which Calcutta is located, supplied 93 per cent of this quantity. Japan is at present India's only real competitor in the Orient.

INDIAN GOLD OUTPUT, OCTOBER.—Following is the output of gold during the month of October, in the Indian mines:—*Balaghat.*—4,550 tons of quartz crushed yielded 3,586 oz. and 4,004 tons of tailings cyanided yielded 371 oz., making a total of 3,957 oz. of gold. *Champion Reef.*—Milled 15,111 tons which produced 8,939 oz. scalings from plates old mills [illegible]1 oz. Base bar 65 oz. and 19,416 tons of tailing treated by the cyanide process produced 2,268 oz., making a total production of 11,783 oz. of gold. *Coromandel.*—1,100 tons of quartz crushed yielded 303 oz. and 1,200 of tailings cyanided yielded 77 oz., making a total of 380 oz. of gold. *Mysore.*—16,550 tons of quartz crushed produced 15,403 oz. and 12,975 tons of tailings treated by the cyanide process yielded [illegible]5 oz., making a total of 17,319 oz. of gold. *Mysore West.*—Mill ran 680 hours, crushed 2,167 tons and yielded 455 oz. bar gold, and cyanided 2,496 tons of tailings yielded 144 oz. of standard gold. *[illegible]ndydroog.*—7,100 tons of quartz yielded 5,569 oz. and 7,290 tons of tailings cyanided produced 730 oz., making a total of 6,299 oz. of gold. *Oregum.*—Stuff crushed 10,206 tons, gold produced 4,823 oz., and slimes and tailings cyanided 8,743 tons, gold produced [illegible] oz., making a total return of 5,604 oz. of gold.

BANGKOK'S STEEL, IRON AND MACHINERY TRADE.—A British consular report, just published, says that the imports into Bangkok of steel, iron and machinery during 1905, fall short of those of 1904 by £169,794. The year 1904 was, however, abnormal, owing to the large quantity of rails and similar material brought in for the Royal Railway Department, but for this fact the 1905 figure would easily equal the average supply. In steel bars, plates, girders, etc., the local demand is said to be increasing, more particularly for girders, which are rapidly taking the place of teak for building purposes, owing to the very high price and increasing demand for teak on the home market. Steel is also gradually but surely replacing teak for lighters, cargo boats, and small steamers. *Cycles and Motors.*—Cycles and motors sprung from £1,023 in 1904 to £22,127 in 1905. This increase is really due to the import of a small number of private motor cars. The roads of Bangkok are poor and limited in extent; conditions are quite unfavorable to a demand for motor traction as a medium for heavy transport, and the import of motors is necessarily confined to the requirements of a limited number of private owners. Owing, however, to the large extent to which Bangkok and the surrounding country is provided with and depends upon waterways, circumstances are distinctly favorable to the introduction of marine and river motors. It is not sufficient, however, that firms should distribute catalogs or acquire local agencies. An intelligent study of the needs and conditions of the neighborhood by a skilled representative is essential. The motor cars which have found their way to Bangkok, though of Continental makes, have been for the most part procured through British agencies. It might be well, therefore, to recommend that the latter be more thorough in their attention to the details of consignment. A certain carelessness is apparent from the frequency with which vital parts of machinery are omitted, "spares" are forgotten or wrong sizes sent. Much inconvenience is suffered and expense is incurred by the consignee in cabling for missing parts, all of which might be avoided by the exercise of reasonable attention by the consignor.

INDIA'S METAL GOODS PURCHASES.—A detailed analysis of India's purchases in metal and machinery for the year 1905-6 is given by the *Government's Trade Journal*. From the following statistics (amounts in gold) it will appear that the imports of hardware and cutlery have declined by about 4.5 per cent, while sewing-machine purchases considerably increased:—

	1903-4	1904-5	1905-6
Cutlery	$418,475	$498,450	$468,325
Agricultural implements	236,050	261,825	276,250
Other implements and tools	372,245	377,675	441,160
Enameled ironware	604,400	335,525	441,126
Sewing machines	326,125	335,515	362,010
Unspecified hardware	5,782,021	5,890,300	5,583,500
Total	$7,749,316	$7,699,290	$7,572,321

Of the total the United Kingdom increased its percentage to 68.8, Germany increasing in proportion, Belgium and Austria showing a decline. In enameled ware Austria was formerly supreme, but in 1905-6 her share receded from 62 to 40 per cent, while Germany's advanced from 31 to 54 per cent. Germany likewise increased her hardware and cutlery sales from 18.6 to 19.4 per cent of the total. The following gives the total values of the imports of iron and steel for the last five years:—

	Iron.	*Steel.*	*Total.*
1901-2	$ 9,677,500	$ 6,535,525	$16,213,025
1902-3	10,101,622	6,853,425	16,955,047
1903-4	11,269,275	8,736,730	20,006,005
1904-5	12,617,015	7,801,110	20,418,125
1905-6	11,369,550	10,781,805	22,151,355

There was a contraction in the receipts from the United Kingdom which supplied only 53.9 per cent of the total quantity and 61.5 per cent of the total value, as against 60.5 per cent and 67-6 per cent in 1904-5, the loss being in iron productions, while the British sales in steel alone increased. Germany and Belgium, however, registered an advance in both departments.

The continuous growth in the importation of machinery is stated to be one of the most healthy features of Indian trade, and has been remarkable in the year 1905-6. The totals of the various classes of machinery imported into all India were as follows:—

Steam engines and parts	$ 3,427,300
Textile	8,210,640
Electrical	768,650
Mining	197,000
Other descriptions	3,795,310
Total	$16,398,900

FINANCIAL AND MISCELLANEOUS

AMERICAN CONSULATE, KIAOCHOW.—An American consulate has been opened at Kiaochow.

BORNEO MANGANESE.—A cargo consisting of 2,850 tons of maganese was recently shipped from Borneo to England.

TAKARADA OIL COMPANY, JAPAN.—This company, with headquarters at Nagaoka, has declared a dividend of 30 per cent *per annum*.

ARTESIAN WELL EQUIPMENT, BANGKOK.—Messrs. Howarth Erskine, Ltd., of Singapore, are constructing for the Siamese Government at Bangkok two steel towers with tanks over artesian bores.

PENANG (S. S.) ESTIMATES, 1907.—The municipal estimates for 1907 show an expenditure of $936,918 and a revenue of $949,384. The yearly salary of the Municipal Engineer has been raised from $7,000 to $8,200.

IMPERIAL OIL COMPANY, JAPAN.—An oil concern called the Imperial Oil Company has been organized at Tokyo by Japanese with a capital of -Y-1,000,000, with the object of manufacturing kerosene oil by chemical means.

HANKAKU (JAPAN) RAILWAY COMPANY.—At a recent general meeting of this company a dividend at the rate of 4.2 per cent *per annum* was declared. It was decided to increase the capital stock by -Y-50,000, which will be used as the fund for starting shipping enterprise.

IMPERIAL JAPANESE IRON WORKS.—The Imperial Iron Works at Wakamatsu, Japan, gives employment to 6,000 regular workmen, besides 1,000 on the temporary rolls. The output of the works for 1906 is expected to be large. All of it will be exported to Southern China.

EAST ASIATIC STEAMSHIP COMPANY.—This company, which has headquarters at Vladivostok, intends to increase its capital from 3,500,000 to 15,000,000 roubles. At the same time it is reported that the Chinese Eastern Railway has a scheme to attract the freight of North China to Vladivostok.

YOKOHAMA RAW SILK MARKET.—The Yokohama raw silk market is very active at the present. The boom is ascribed to large demands from America where agricultural crops show enormous increase this year thus proportionately increasing the purchasing power of the farmers.

AGRICULTURAL MACHINERY IN CHINA.—An American consul in China has recently had a number of inquiries regarding agricultural machinery, including complete outfits for farming with improved American steam-power machinery, such as steam plows, drills, steam-power reapers, threshing machinery, etc.

SUZUKI (JAPAN) ROPE MANUFACTURING COMPANY.—Owing to the increase in this company's business it has been found necessary to increase the capital from -Y-180,000 to -Y-1,000,000, and next year the factory building will be enlarged. The company is to be called in future the Japan Rope Factory.

SIAM ELECTRICITY COMPANY, LTD., BANGKOK.—At the recent seventeenth extraordinary general meeting of the shareholders of the Siam Electricity Company, Ltd., Mr. Aage Westenholz presided. It was decided to increase the capital of the company by the issue on January 1st of 3,000 shares at £10 each.

COTTON MILL, TOKYO.—A cotton mill has just been established at Tokyo under the name of the Nisshin Boseki Kwaisha, with a capital of -Y-10,000,000. The shares are all divided among the promoters and will not be offered for public subscription. A number of foreigners are interested in the enterprise.

TRAMWAY EXTENSION, JAPAN.—A tramway company under the title of the Kinki Denki Tetsudo Kaisha is being organized with a capital of -Y-4,000,000, by Japanese promoters. The length of the entire system will be 54½ miles. The main line is from Osaka to Nara, with three branches to Tanbaichi, Yoshino and Hase respectively.

JAPAN ACETIC ACID MANUFACTURING COMPANY.—This company has a plan for the increase of its capital and the extension of its business. Owing to the recent prosperity in different branches of Japan industry, the demand for acetic acid at home has largely increased, the consumption during 1905 having amounted to 1,470,000 lbs. against 830,000 lbs. for 1903.

SARAWAK (B. N. B.) ESTIMATES, 1907.—The Sarawak estimates for 1907 contemplate a revenue of $1,212,335 and an expenditure of $1,231,576. The "farms" have been let at a rental of $8,000 per month more than at present. The Brooketown and Sadong collieries continue to show a loss, estimated at $160,000 during the coming year. The work includes $6,000 for water pipes and $45,000 for river wall.

QUININE SALE IN JAVA.—The sixth public sale of quinine in Java during the current year was held in Batavia recently. There was put up for sale on this occasion about 5,988 lbs. of Government quinine, and 1,326 lbs. of private quinine. Of the former lot none was sold, while only about 200 lbs. of the private quinine found purchasers, at $4.79 gold per kilogram (2.2 lbs.). The quinine sold has been option quinine, *i. e.*, packing at purchaser's option.

SANYO RAILWAY COMPANY, JAPAN.—The final general meeting of shareholders in this company, prior to the transfer of the railway to the Government, has been held at Kobé. A final dividend at the rate of 14.7 per cent *per annum* was declared. The present directors were appointed administrators, and rewards amounting to -Y-1,870,000 were ordered distributed as follows:—To those who have rendered meritorious services to the company, -Y-20,000; to the present directors and auditors, -Y-200,000; to the staff of the company, -Y-1,650,000.

BRITISH NORTH BORNEO.—Mr. Fred. W. Fraser, Resident of the Interior of the Government of the British North Borneo Company, has just made public his report for 1905. The total revenues for the year under review amounted to $15,384.62, an increase of $2,637.34 over the figures of 1904. The total expenditure was $29,701.10, or $54 more than the previous year. Although the revenue falls short of the expenditure by $14,316.48, attention is called to the fact that a large share of the customs duties at Jesselton is due to the Interior Residency. There is also a royalty on estate tobacco and a share in the General Farms that belong to this district.

CASTOR OIL EXPORTS FROM CALCUTTA.—The exports of castor oil from Calcutta during the first seven months of 1906 are stated at 31,353 cases, 21,162 half cases, and 2,695 drums—in all 760,443 galls. *Liverpool*, South African ports and Singapore take the major part of these exports.

CELLULOID FACTORY, JAPAN.—The Japanese Government favors the establishment of a celluloid factory at Himeji, 25 miles from Kobé. The greater portion of the proposed capital of about 41,000,000 gold will be subscribed by British and German capitalists and the remainder by Japanese, and the factory will provide work for abcut 5,000 employees. Though Japan can produce the camphor, she will have to import the carbolic acid and the cellulose, and also the machinery with which to equip the plant.

ORIENTAL SUGAR REFINING COMPANY.—The prospectus of the Toyo Seito Kaisha (Oriental Sugar Refining Company) shows that the total number of shares offered is 100,000, of which 75,000 are for sale. The promoters of the company number 160, including capitalists in Tokyo, Yokohama, Osaka, Kobé and other places. The business of the new company is to purchase about 5,000 *cho* of land in Formosa for raising sugar-cane. Crude sugar and raw material will be supplied to the sugar-refining companies, to check the import of crude sugar from Java. The total consumption in Japan of crude sugar a year is said to be 8,000,000 piculs, against which Formosa produces only about 1,000,000 piculs, so the prospects of the new company are considered very promising.

COFFEE CULTURE IN JAVA AND SUMATRA.—Java and Sumatra crops of coffee in 1904 amounted to 47,747,240 lbs divided as follows:—Private Java, 16,013,720 lbs.; private Liberia, 18,309,280 lbs.; Government Java, 9,341,884 lbs.; Government Liberia, 4,082,856 lbs. Of the foregoing figures the Sumatra crop amounted to 4,338,400 lbs. old Java and 244,800 lbs. Liberia. Prices of coffee, according to grades, averaged from 11 to 14 cents gold per lb. One of the finest grades of Kroe coffee is raised in a district of that name in Sumatra; in fact, the finest grades of coffee are raised in Sumatra, Padang being the chief port in the coffee district. During 1904 there were exported to the United States some 12,761,367 lbs. of coffee, which was somewhat above that for 1903.

JUTE INDUSTRY OF INDIA.—Consul-General W. H. Michael, writing to the Bureau of Manufacturers of the Department of Commerce and Labor at Washington, thinks the position of the jute mills in India is peculiar. Some are making money and some are losing. Mills that were far-sighted enough to carry over a fair stock of jute from last season are all right, and are earning handsome profits, running as high as $200,000 gold per month. But those concerns which have no jute except what they buy at present high prices are losing right along on the manufacture of heavy goods. The Arathoon Mills, during the first half of the year, earned a profit of $180 gold per loom, while the Hooghly Mills lost $70 per loom. The statement is made, however, that a majority of the mills have made substantial net earnings during the above period.

FRENCH INDO-CHINA TRADE, 1905.—A British consular report shows that in 1905 there was an increase in the exports and imports of French Indo-China amounting to £827,207, or about 6 per cent over 1904, a decrease in treasure dealt with of £91,088; an increase in the transit trade of £103,440, or about 20 per cent; and a total increase of £939,559. The diminution of exports in 1905 was due to the fact that the rice export in the latter part of 1904 was a very large one. The increase in the imports is doubtless partly due to the increased purchasing power of the people. The export of tin during the year was 4,578 tons, valued at £553,915, and of this value only £2,231 refers to Indo-Chinese tin (mostly ore), the bulk of the rest being the Yunnanese product. Indo-China produced 367½ tons of rubber, valued at £97,150. Nearly the whole of the product went to France, whence much of it was sent to the United Kingdom.

TEAK INDUSTRY OF SIAM.—The 1905 export of teak from Siam, 101,397 tons, valued at £817,396, exceeded even the record figures of 1904 (77, 31 tons, valued at £560,174). Under these circumstances the five years' average falls below the 1905 output by 45,133 tons and £434,515 respectively. The following remarks, gathered from an experienced source, explain the present unusual figures, and afford an insight into the future prospects of the Siam teak trade:—"The past season, 1905-6, has been a record one for Siam as regards floating, and no less than 151,000 logs arrived at Paknampho. This number, with stocks of 60,000 logs carried over at that place from the previous season, gives a total of 211,000 logs for disposal, and of these about 125,000 logs reached Bangkok. The three previous seasons, viz., 1902-3 to 1904-5 gave arrivals at Paknampho about 61,000, 113,000, and 138,000 logs respectively. Should the 1906-7 floating season again be an exceptionally good one, there may possibly not be any very great falling off in the actual arrivals at Paknampho for this year, but the year, 1905-6 will almost certainly mark the turning point in the volume of the teak trade of Siam. The rise in price is in response to a good demand in all the consuming markets for teak both at home and in the east. As far as can be seen at present the prospects of these prices for teak remaining at their present level appear to be good.

CHINESE ENGINEERING AND MINING COMPANY, LTD.—At the fifth annual ordinary general meeting of the Chinese Engineering and Mining Company, Ltd., recently held in London, Mr. W. F. Turner presided. The chairman, in moving the adoption of the report and accounts, said that, while there had been a slight pause in the development of the company's business, it had not been such as materially to affect the result, which enabled it after making ample reserves, to maintain the dividend of 10 per cent. The company's debenture issue, which was originally £500,000, had been reduced by £78,540. The stock of coal and coke stood at £2,725, as compared with over £19,000 in the previous account. The demand for the company's coal had been fully maintained, but there had been a diminution in the output. That was the explanation of the very small stock which was on hand at February 28th last. The situation throughout the year had been that the company had been unable to keep pace with the demand for its coal, and that consequently it had been working practically without any margin in the way of stock. Notwithstanding the fact that the output during the past year was considerably larger than a few years ago, it was practically sold out at the end of the year, and the demand was still in excess of the supply. The steamers account, which last year stood at £58,581, had been increased by the balance of the cost of the steamship *Kaiping* to £94,819. The expenditure to date on the harbor works at Chingwangtao amounted to £19,970, and the expenditure at mines and depots, £19,340, was spread chiefly over the Tongshan and Linei mines and what was known as the northwest shaft. The gross profit for the year, £178,580, showed a reduction of £25,000 compared with the previous year. That was due to the diminished output and the consequent diminution of the sales, and also to the somewhat increased cost of production. The total profit for the year amounted to £144,447, out of which £10,000 was applied to the redemption of debentures and £30,000 was carried to the reserve for depreciation account, thus bringing up that reserve to £110,000. There remained a balance of £104,447, which, with the sum of £8,199 brought forward from last year, made an available total of £112,646. An interim dividend of 1s. per share was paid on May 1st last, and the company proposed to pay on November 2d a balance dividend of 1s. per share, making 10 per cent for the year, leaving £12,646 to be carried forward. With regard to the results of the current year, so far as they had gone they were eminently satisfactory. Mr. G. T. Symons seconded the motion, which was agreed to. The Chairman proposed the re-election of Messrs. Georges de Laveleye, George Paget Walford, Charles Balser, and Emile Francqui. This was seconded by Mr. Edmund Davis and agreed to. On the motion of Mr Doney, seconded by Mr. Glanville, Messrs. Annan, Kirby, Dexter and Co. were reappointed auditors.

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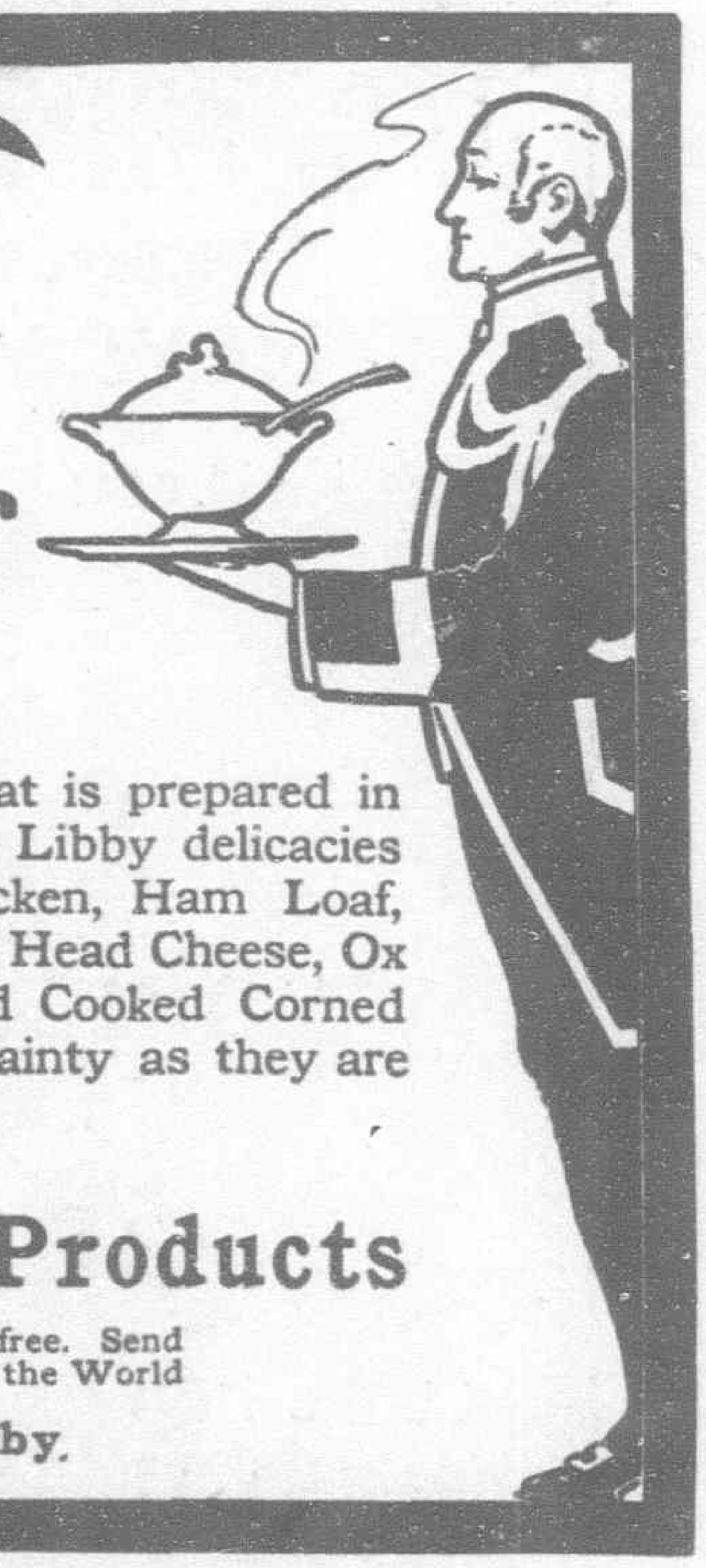

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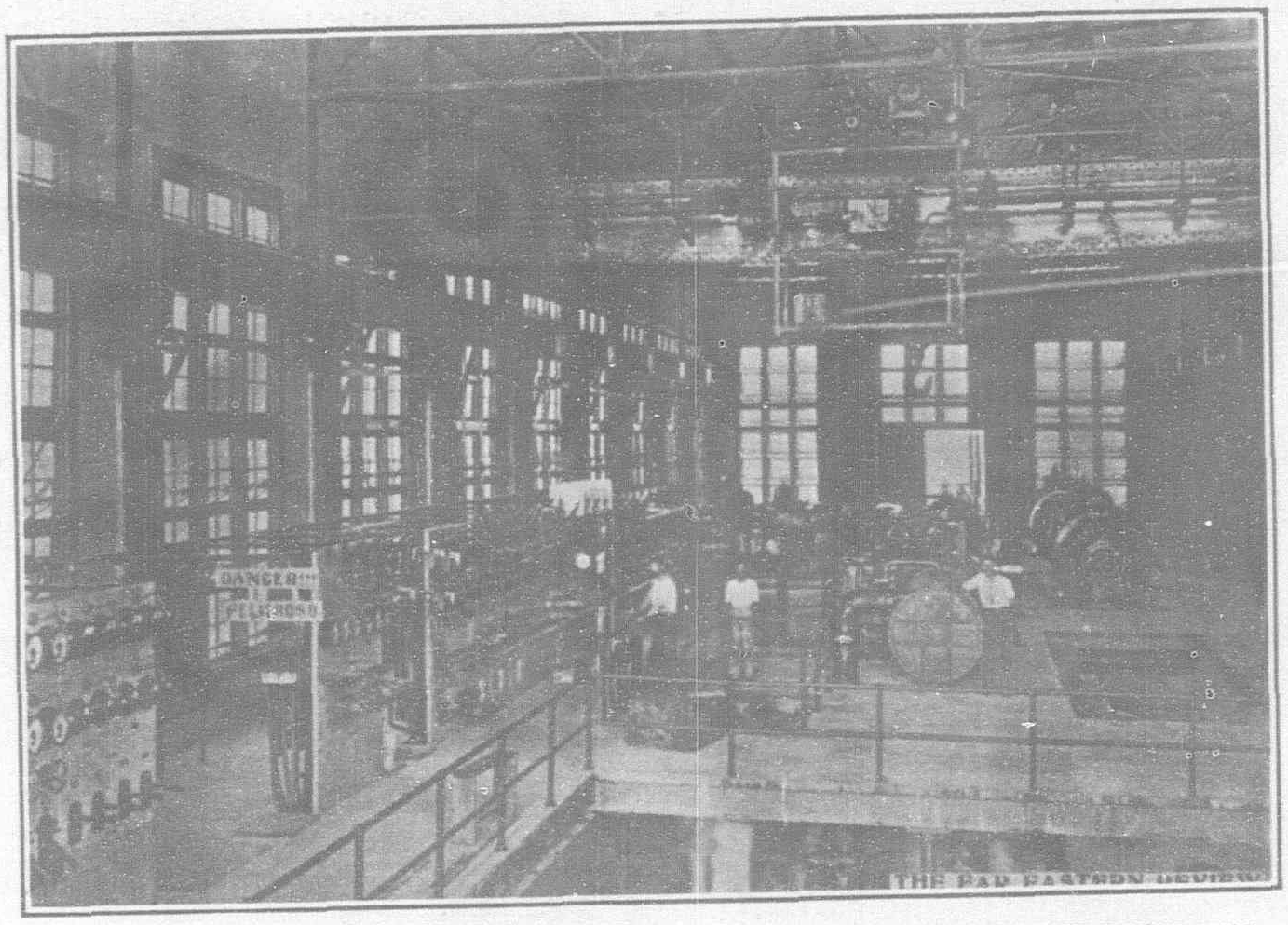

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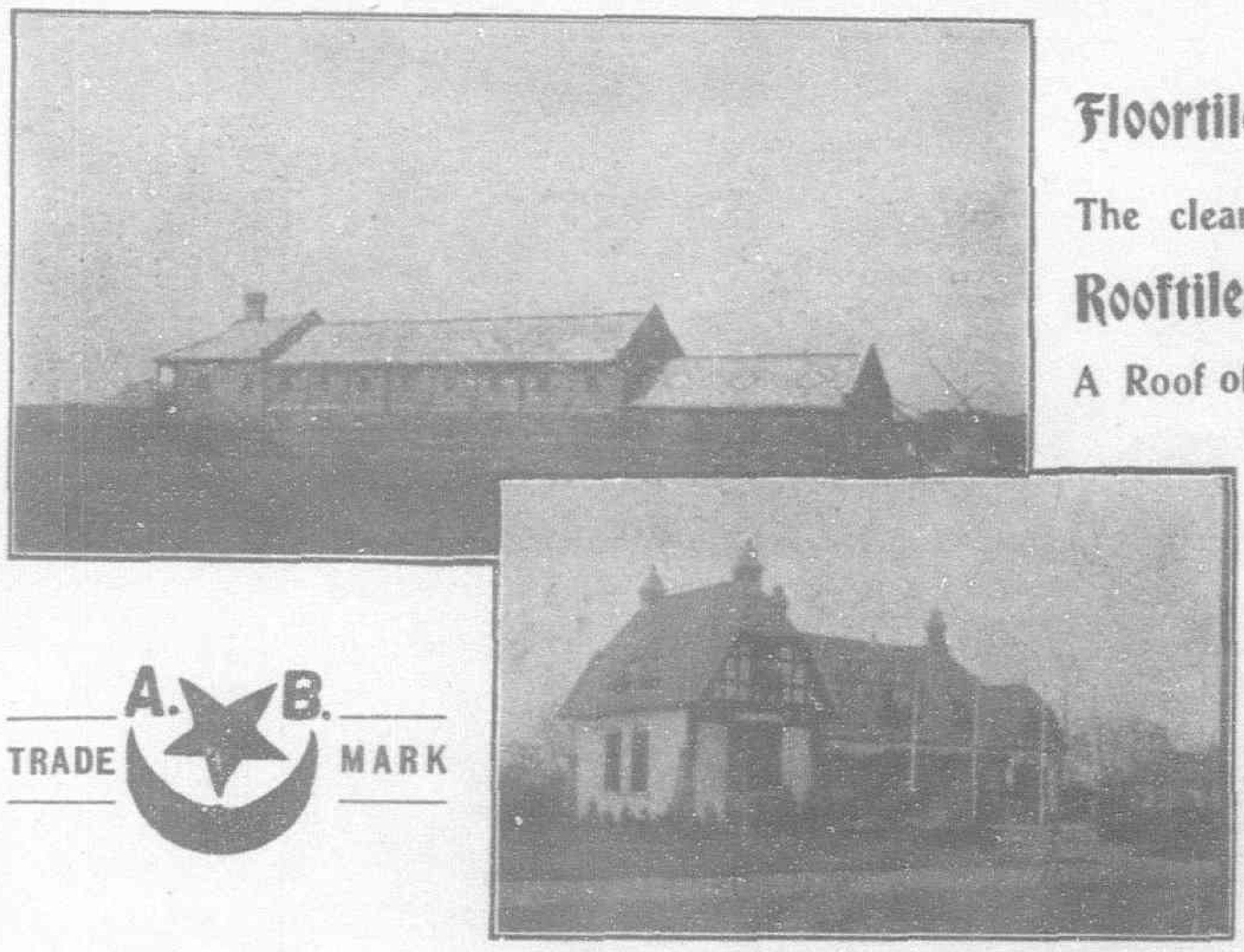

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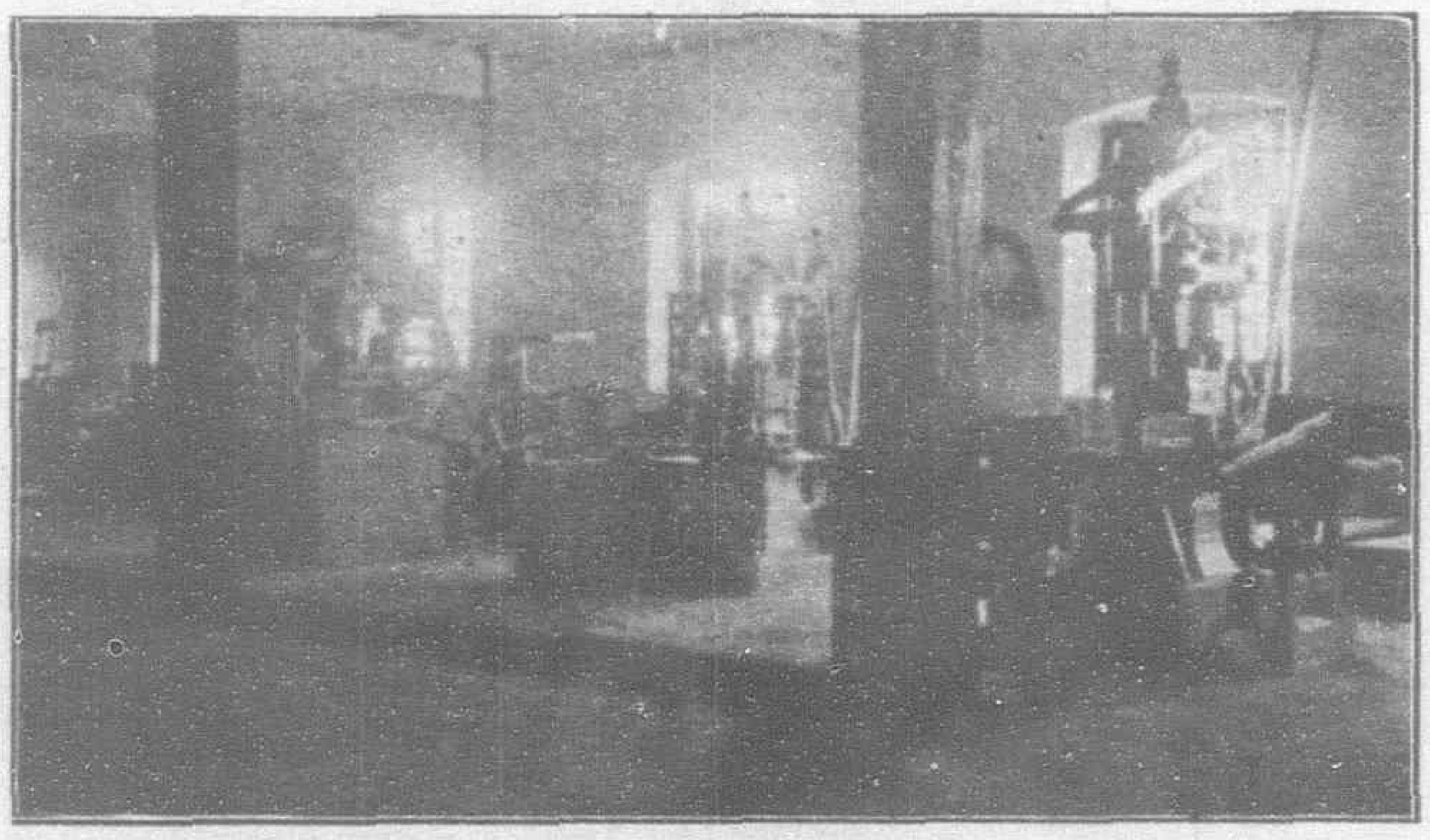

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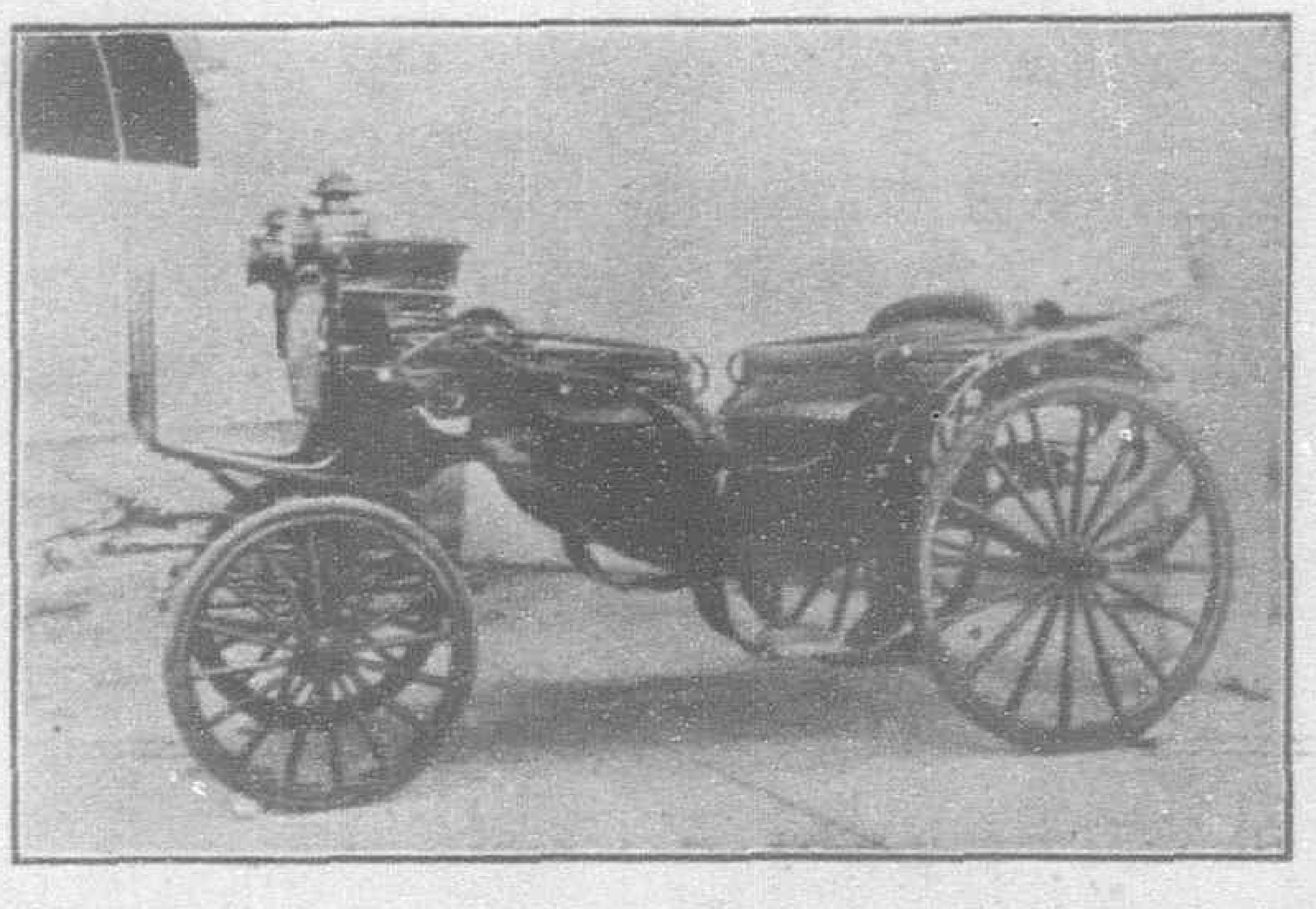

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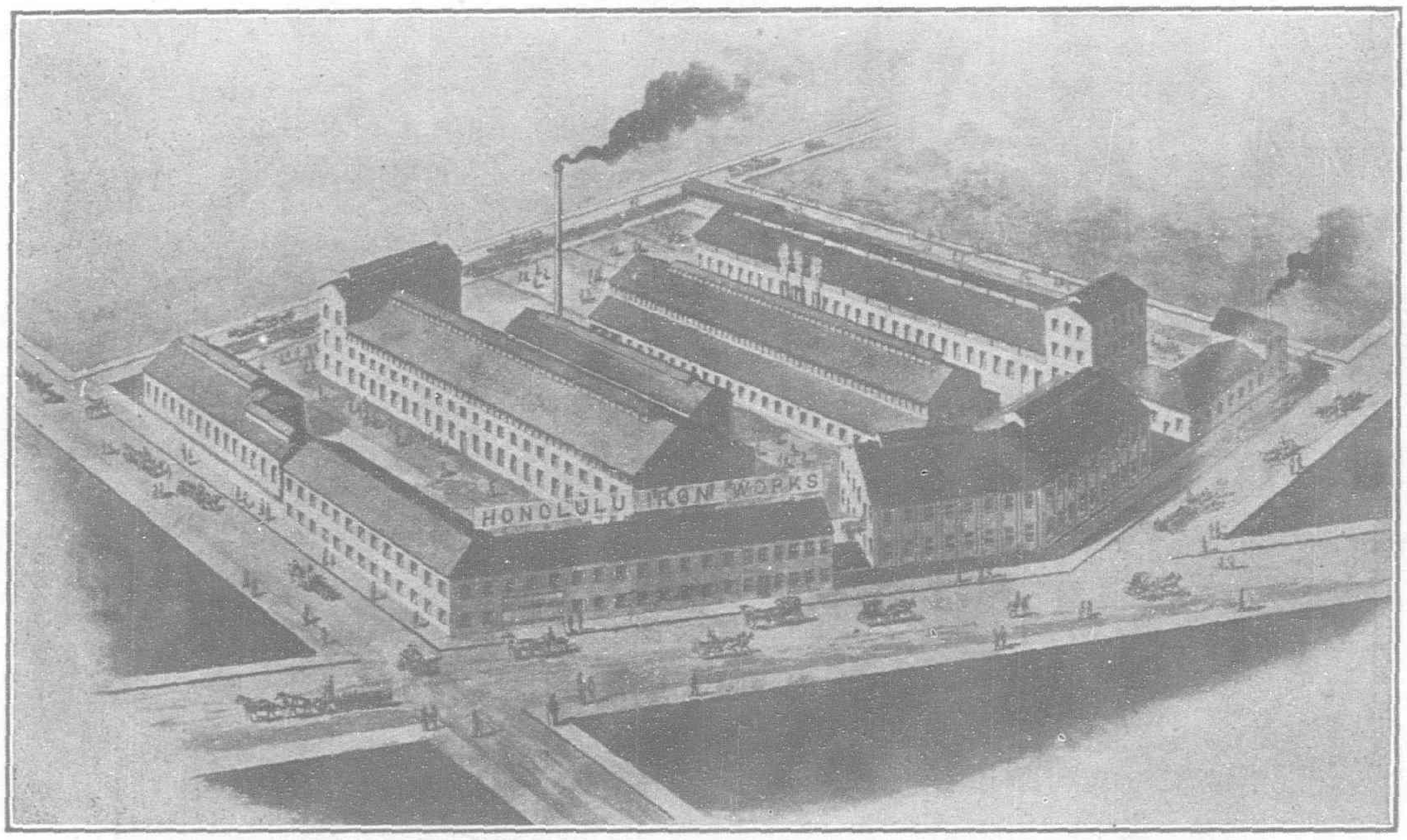

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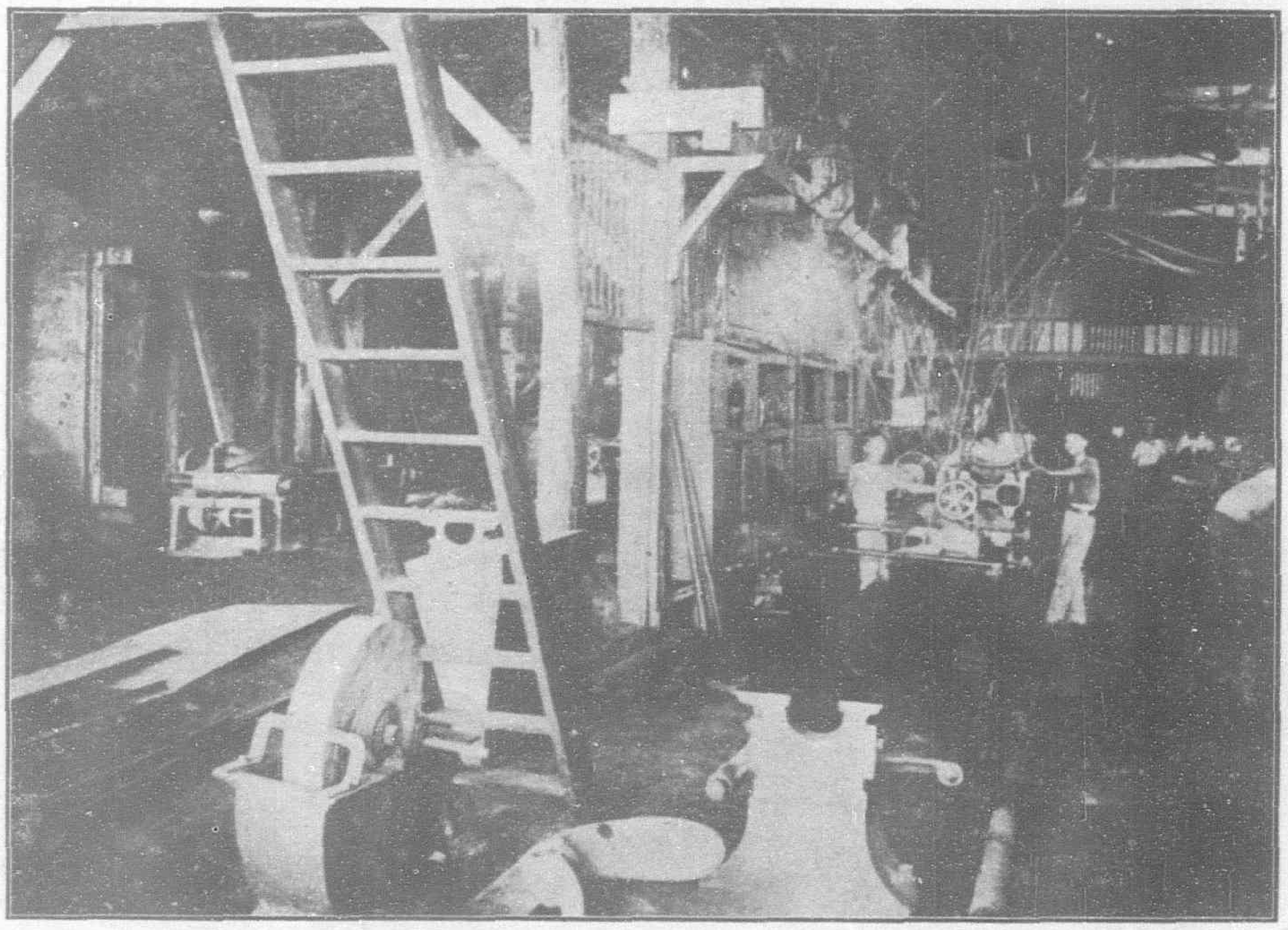

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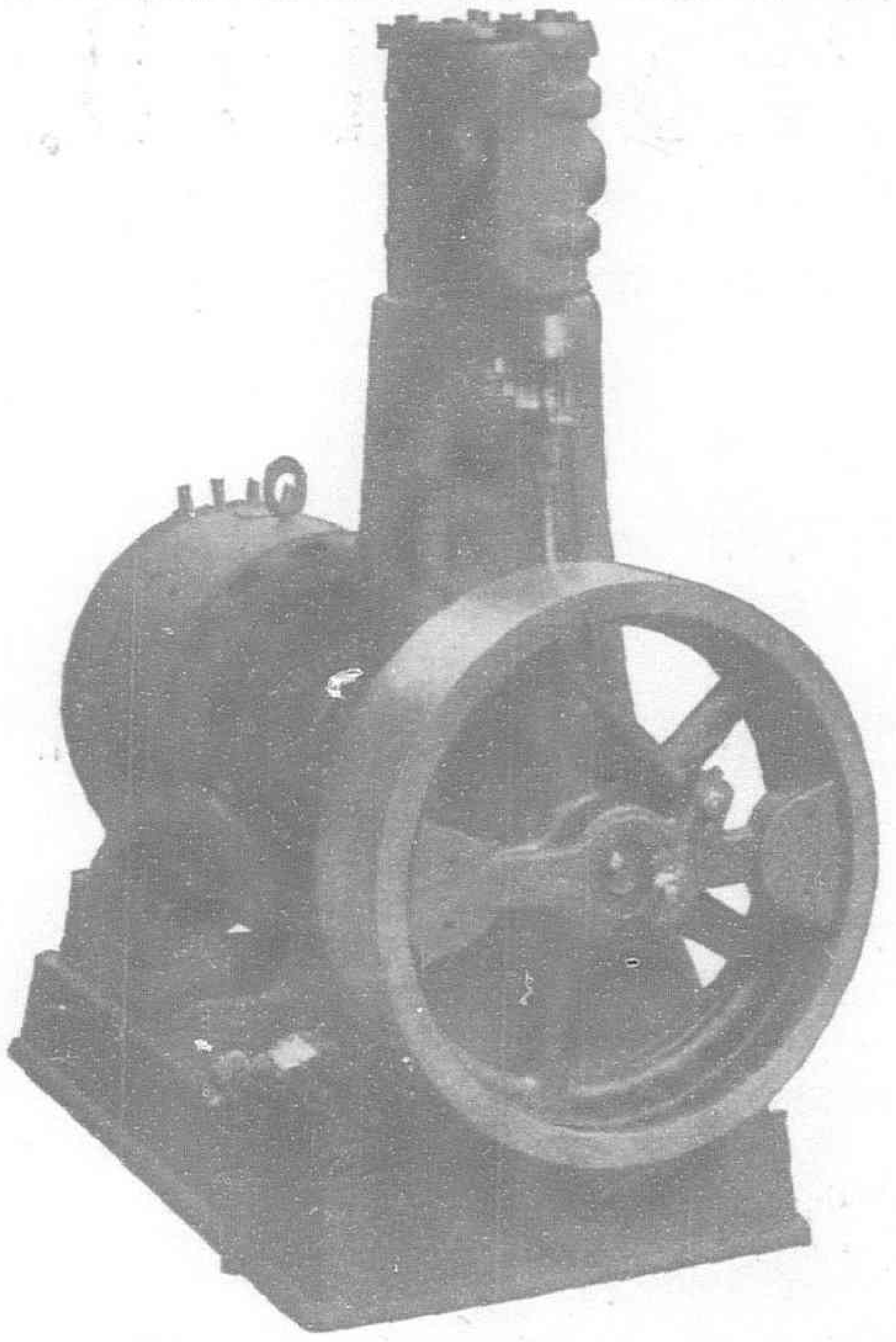

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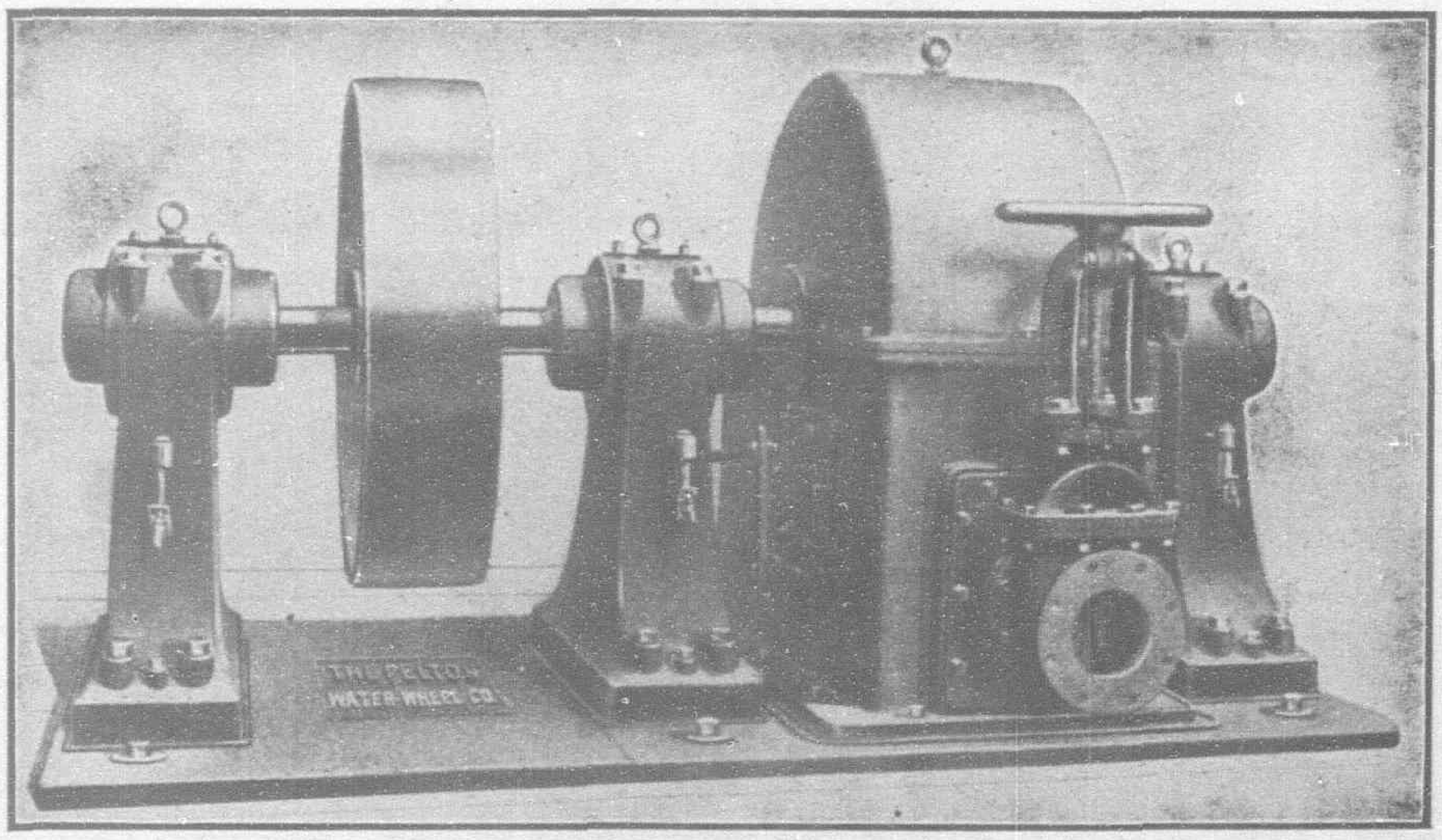

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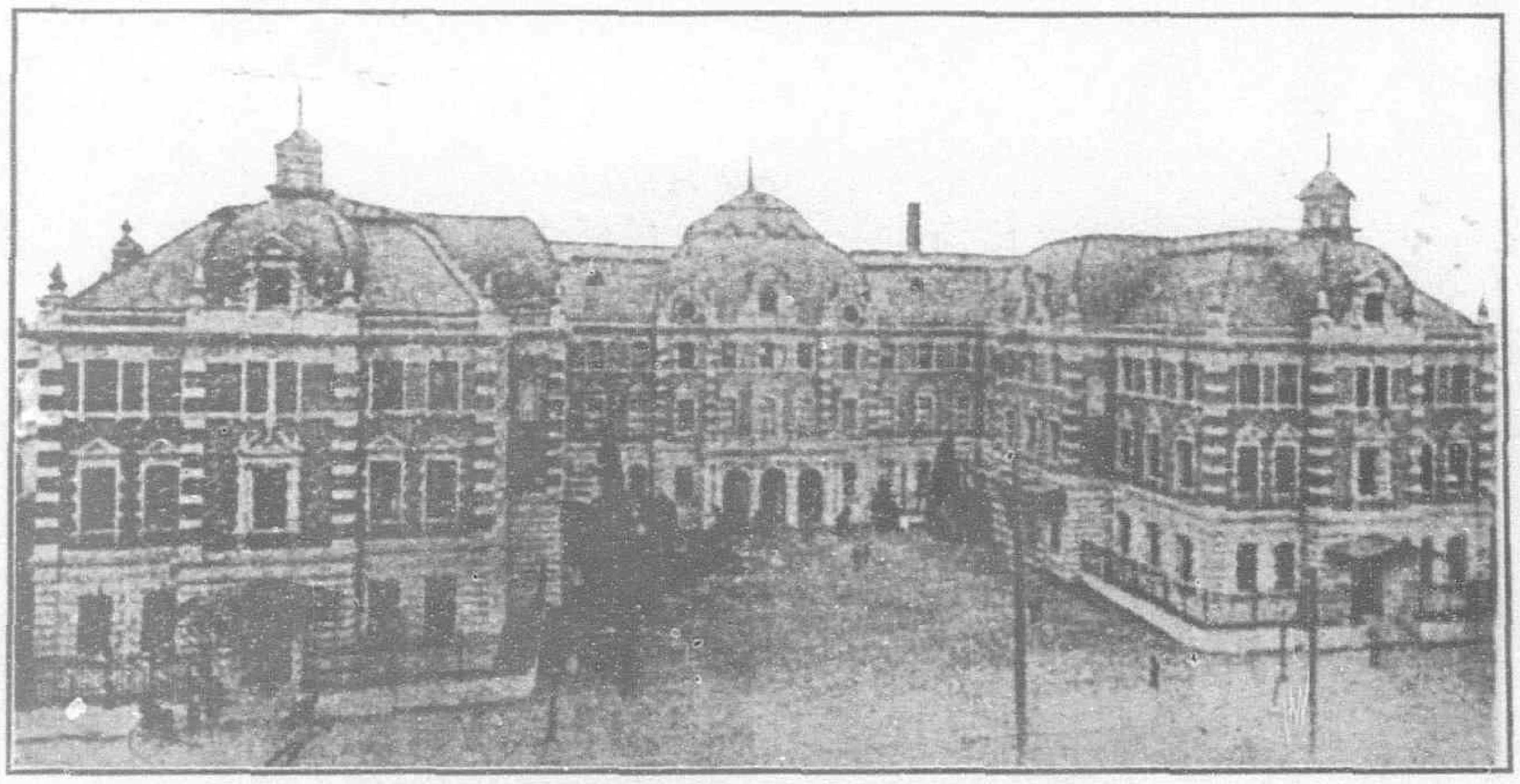

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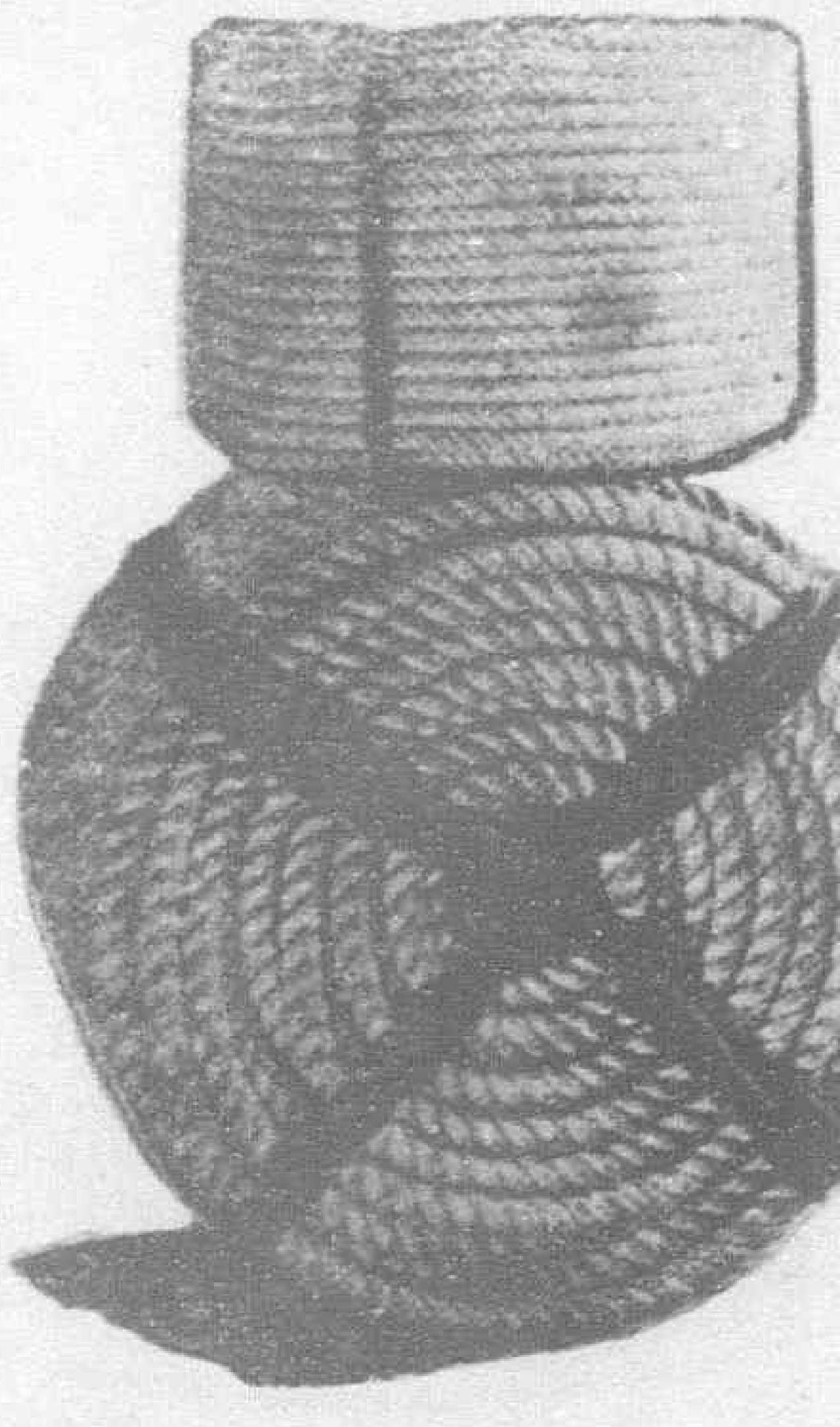

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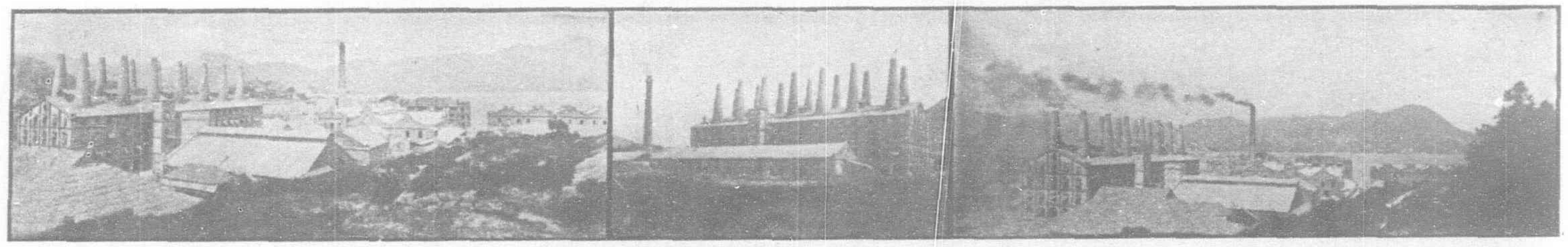

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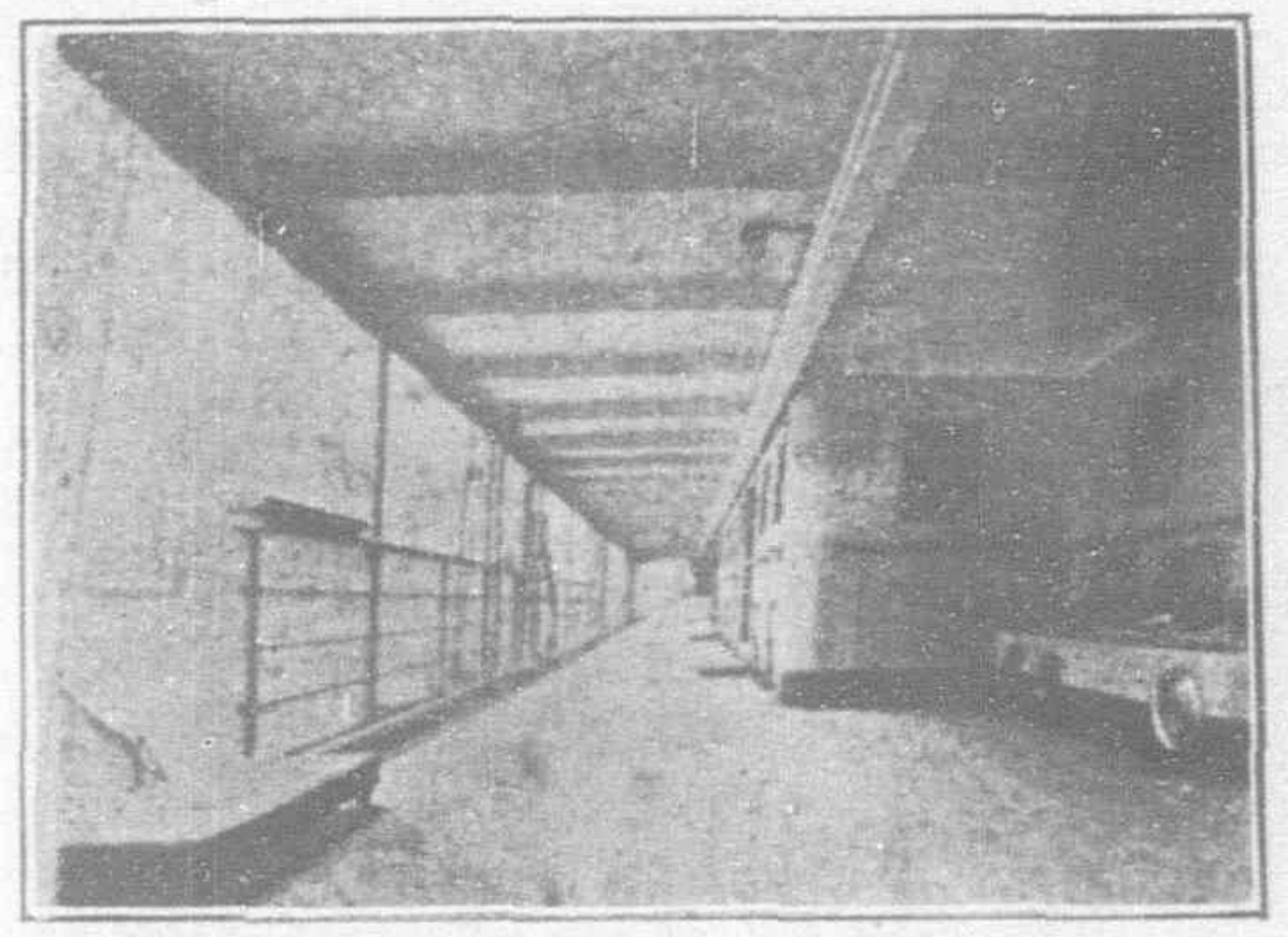

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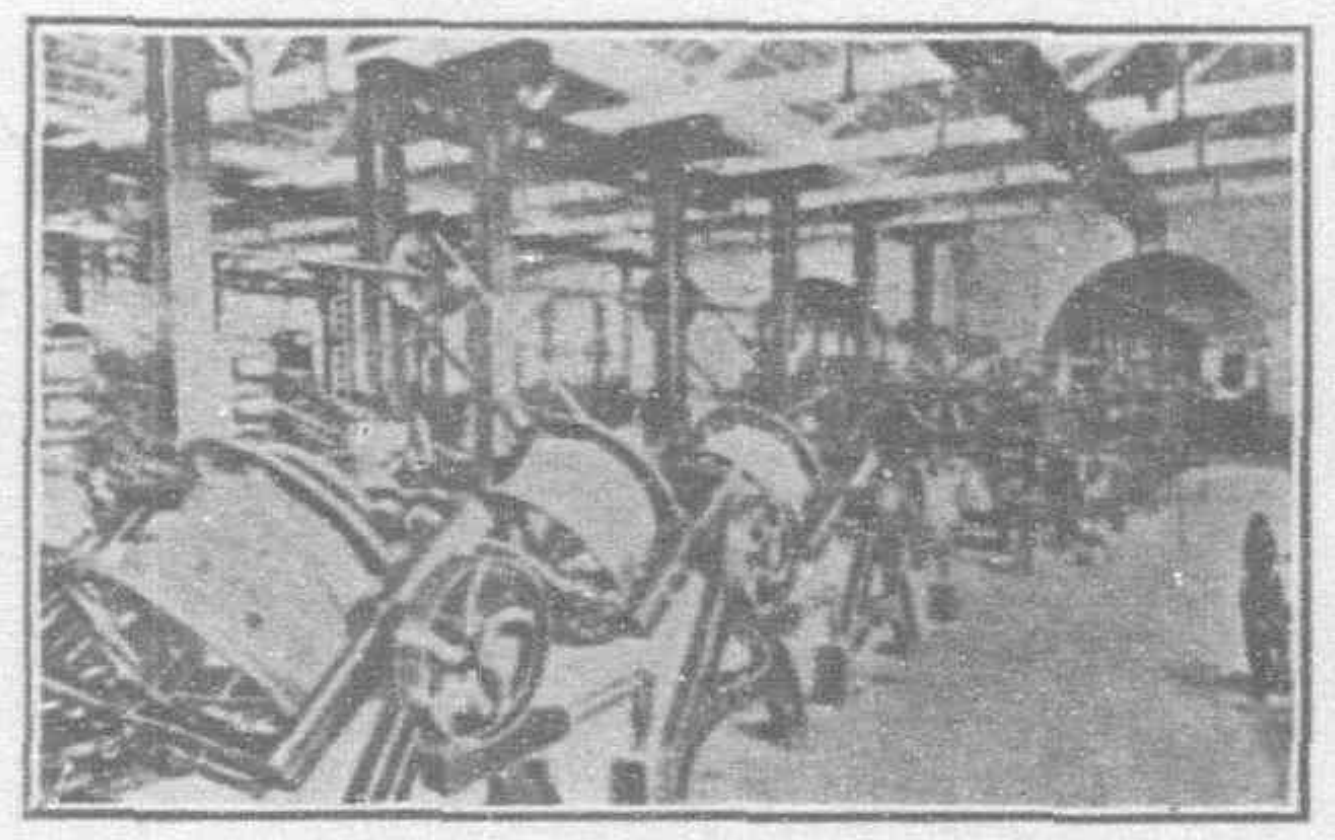

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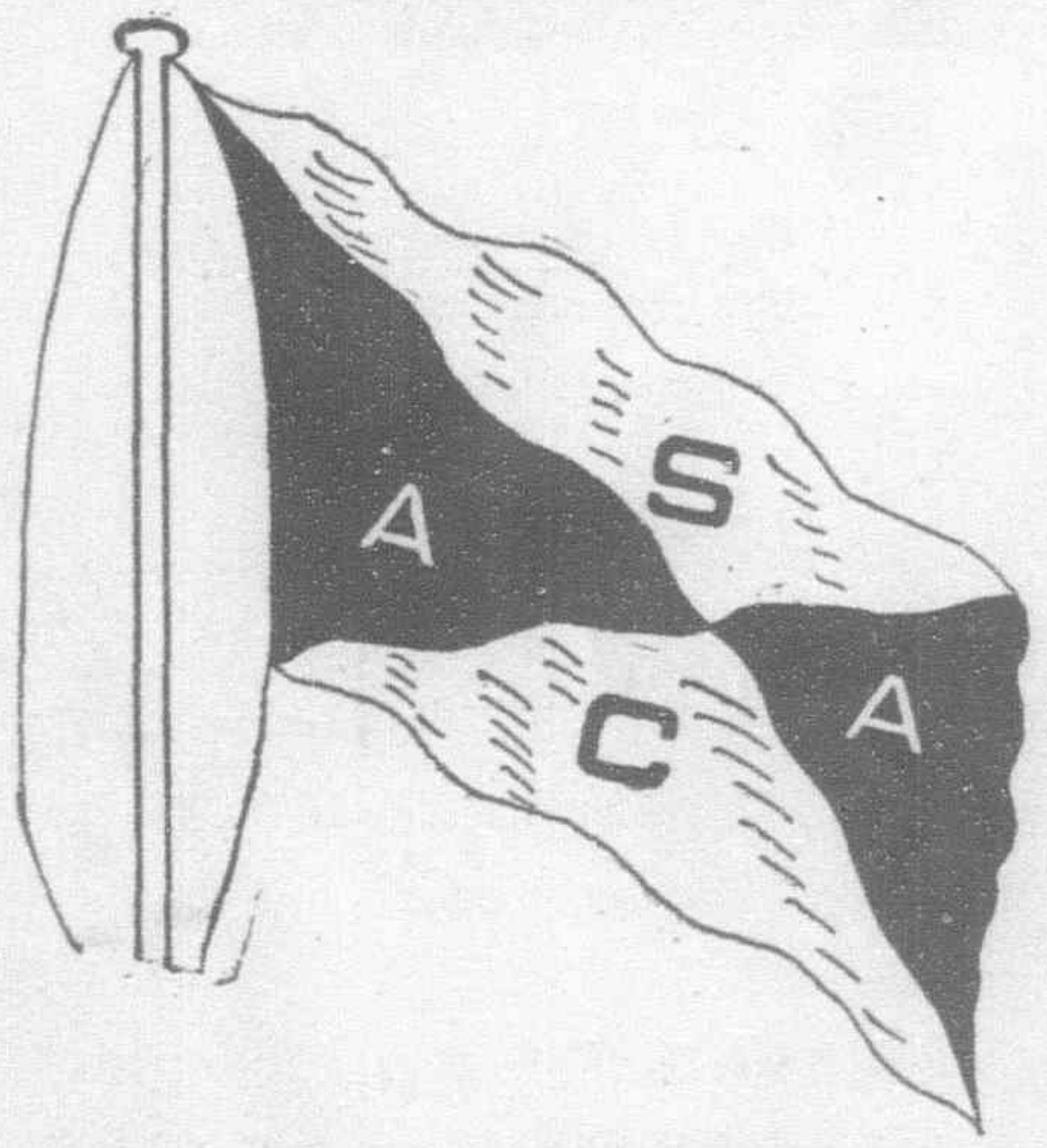

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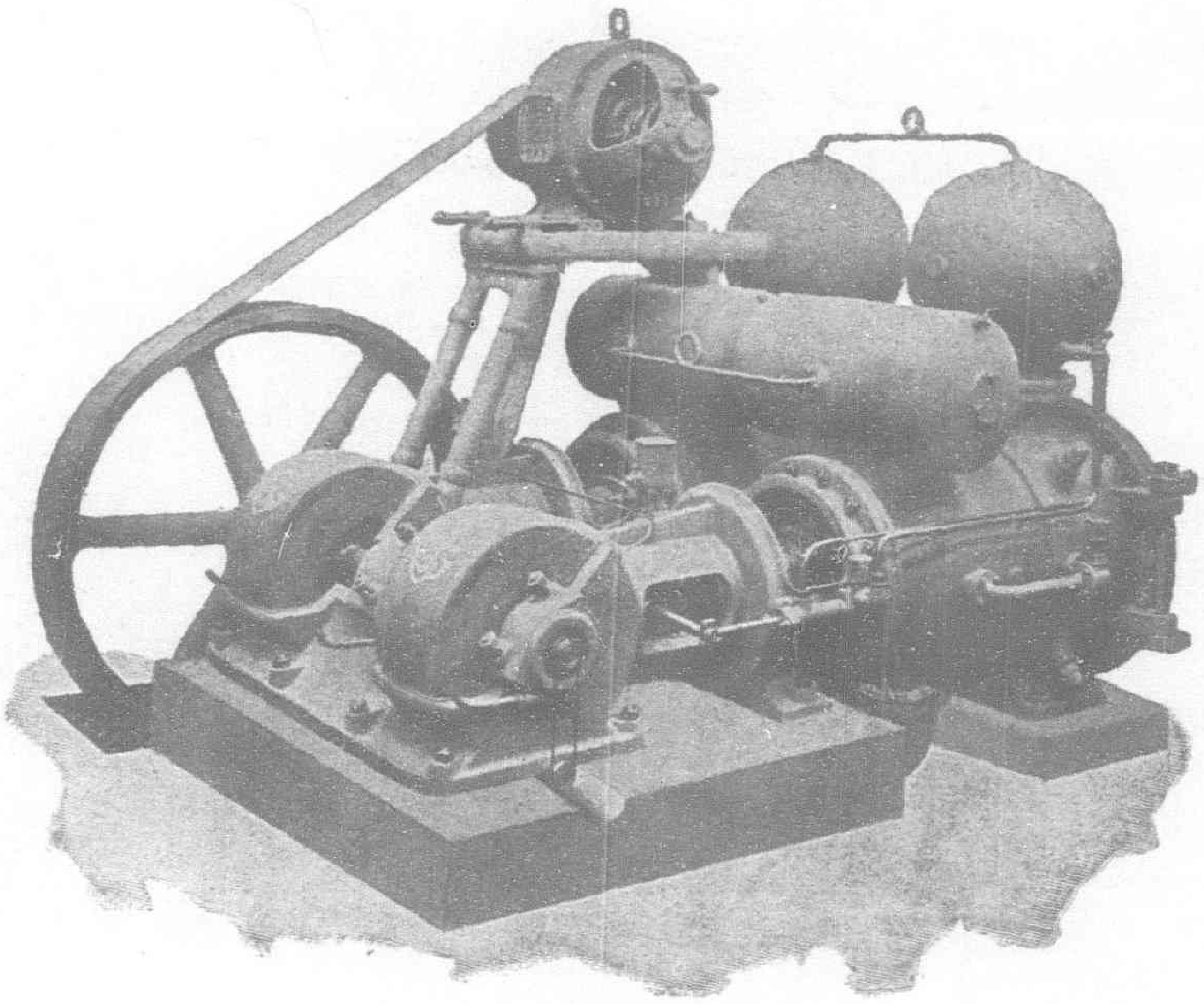

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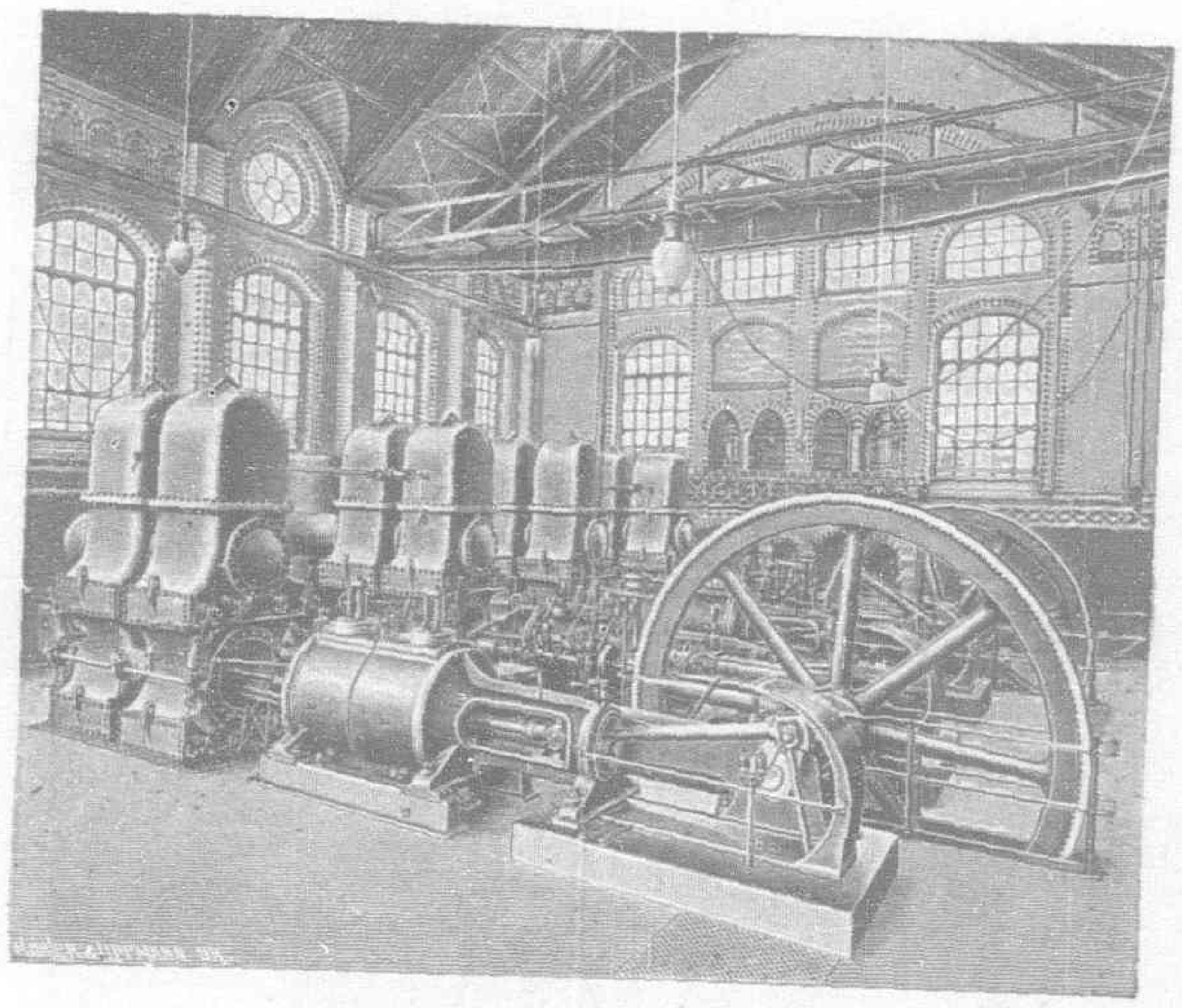

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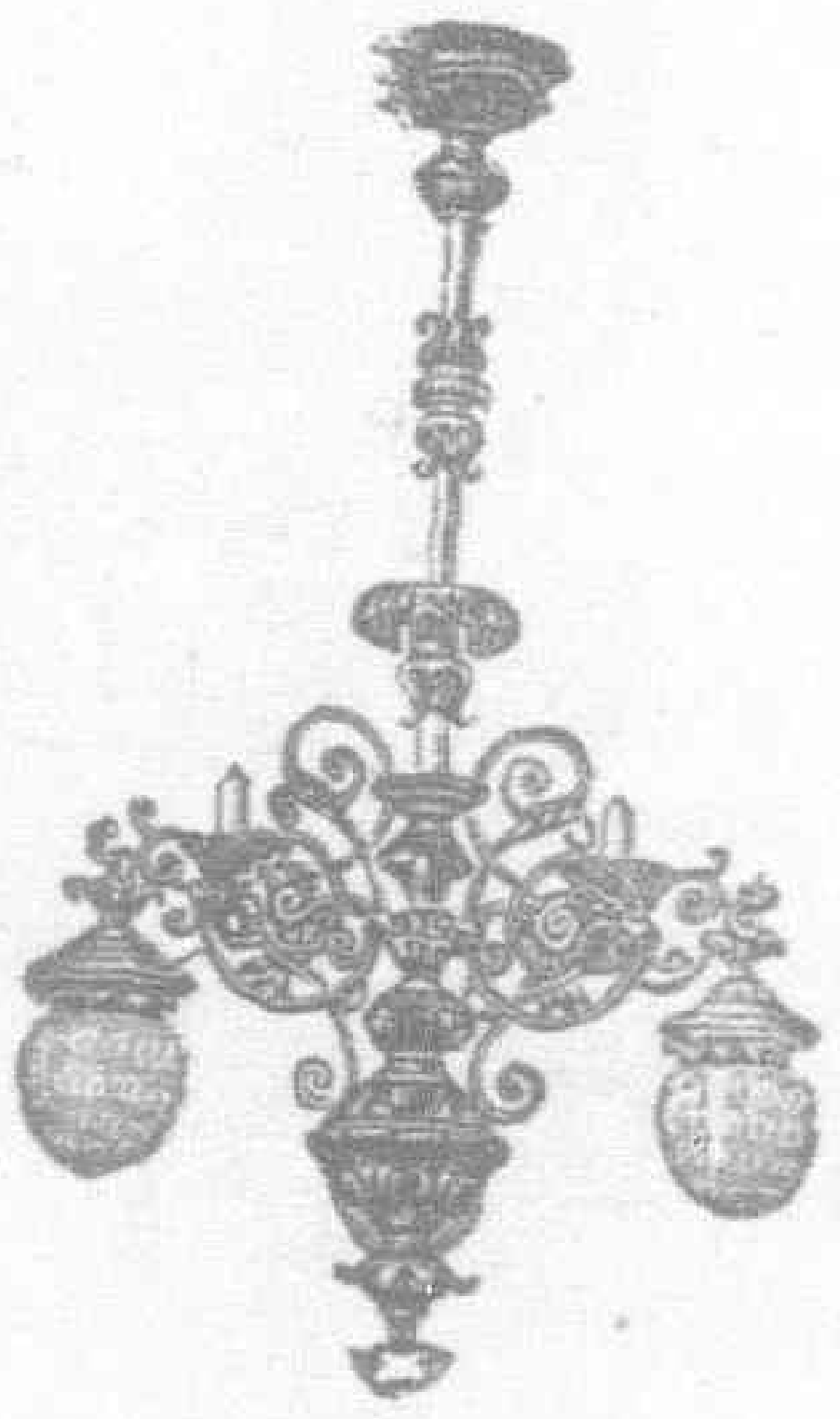

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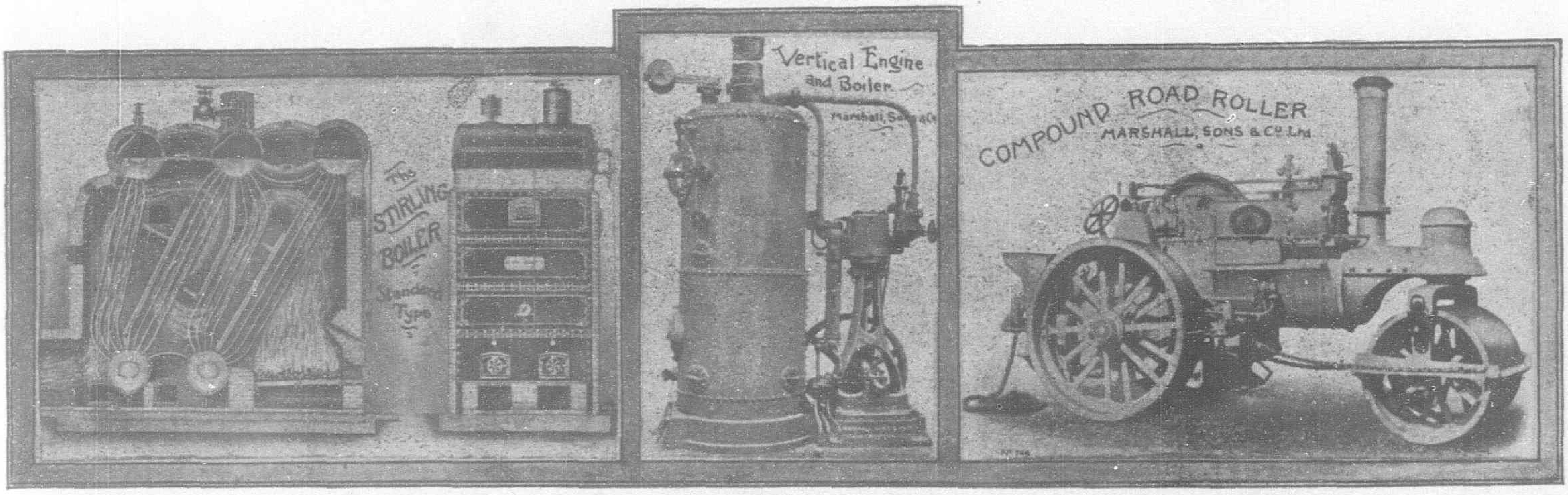

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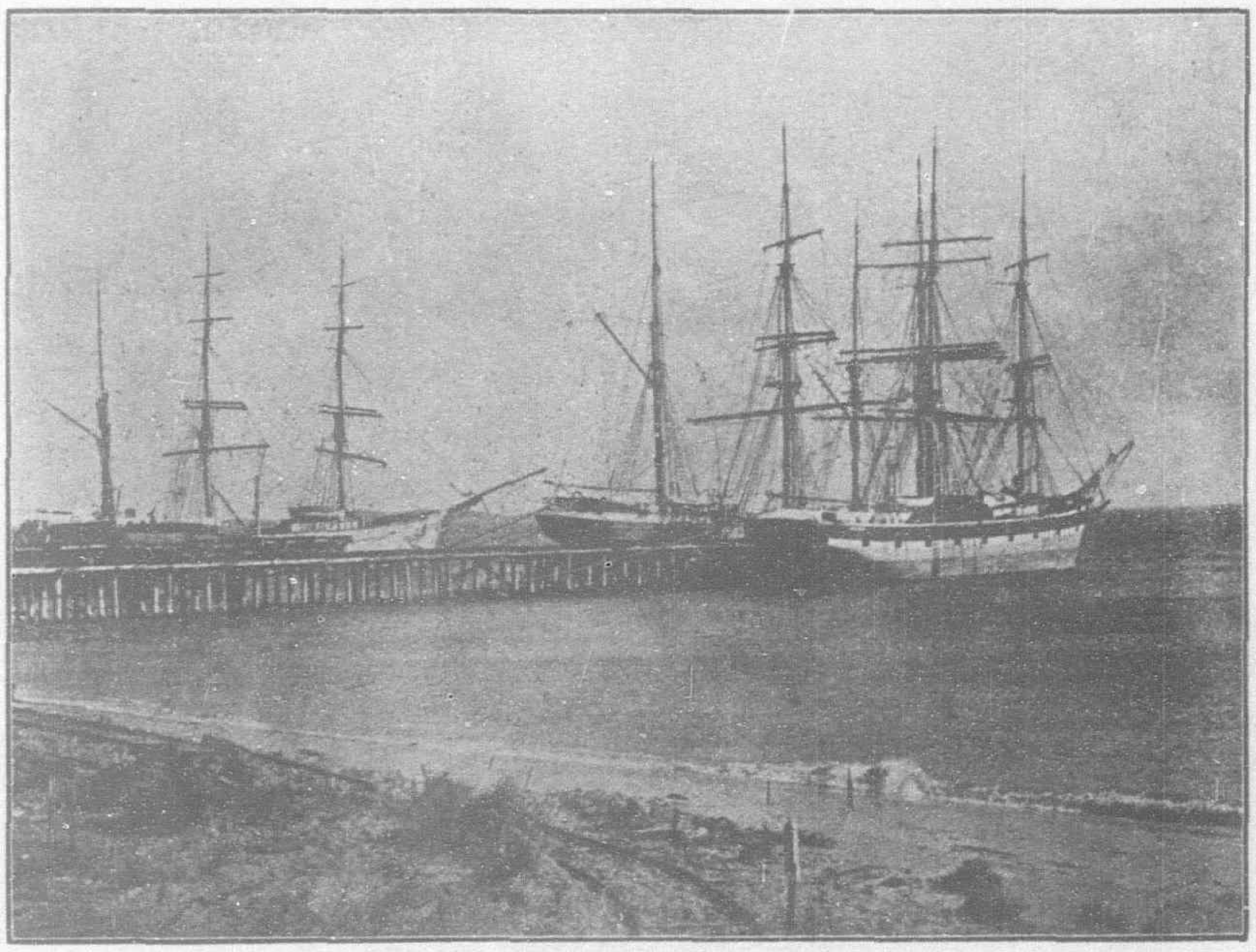

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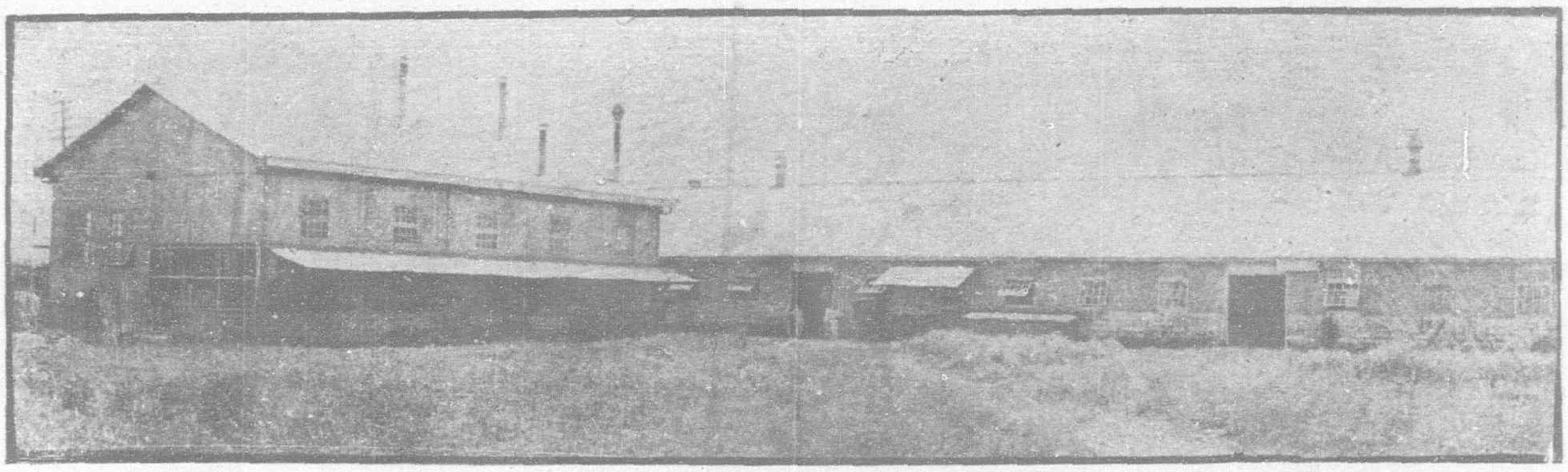

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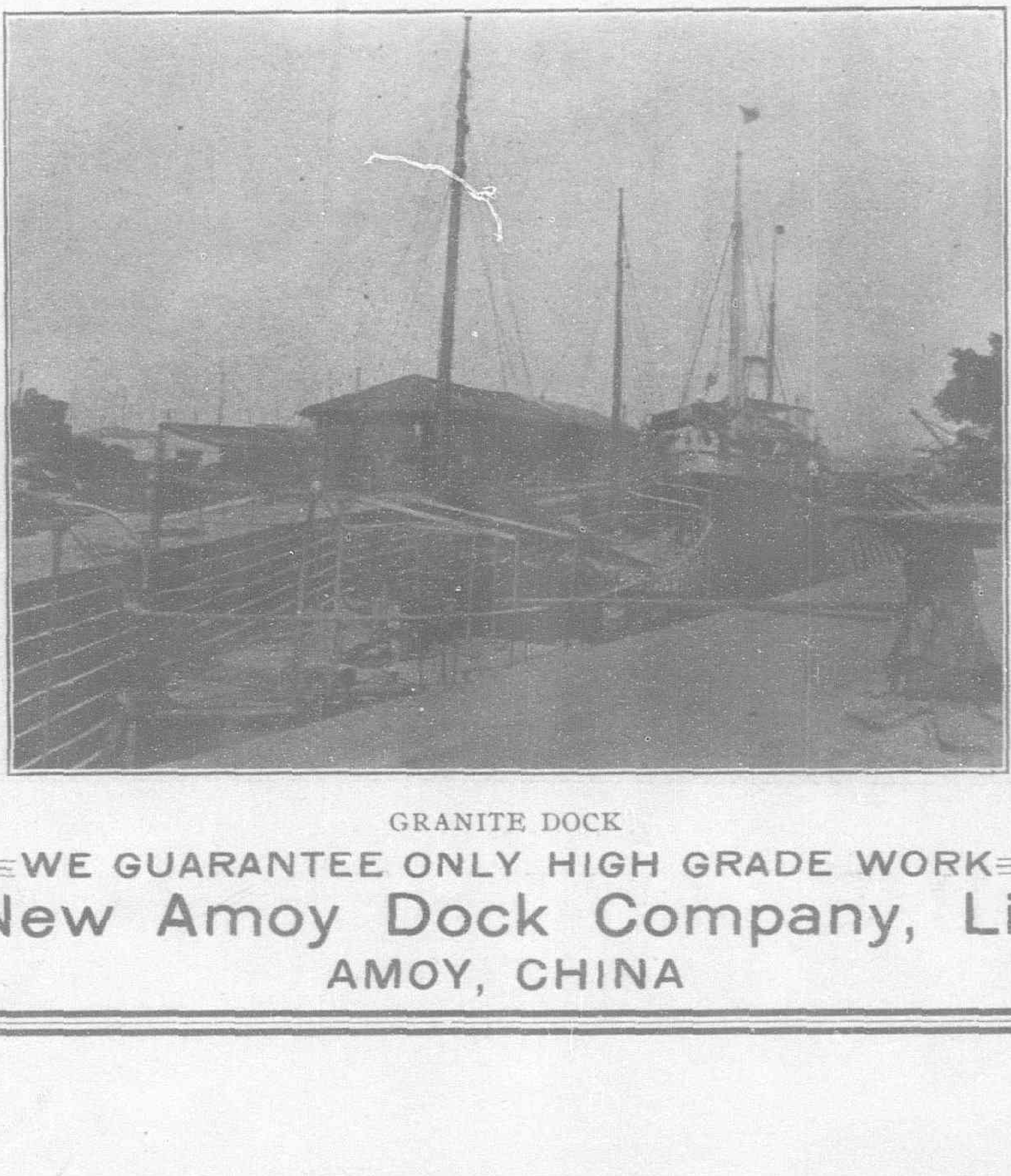

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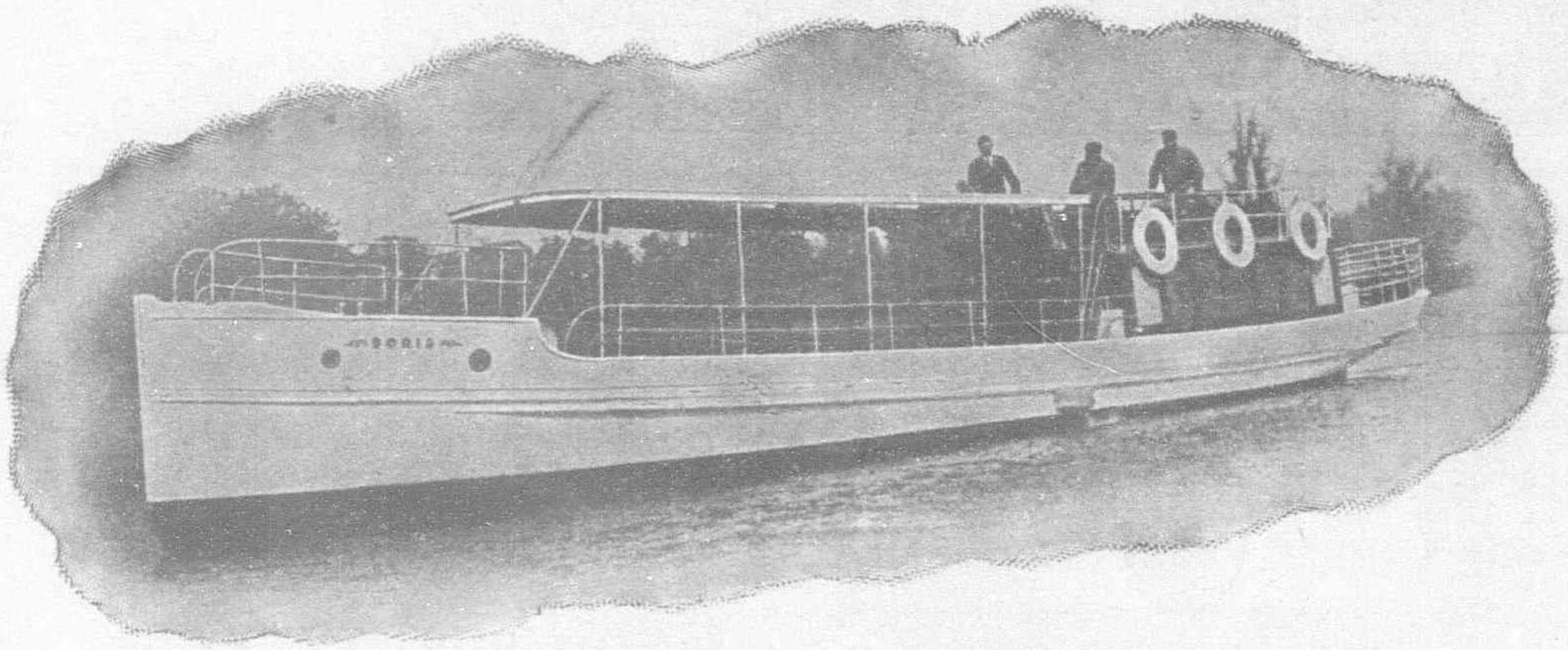

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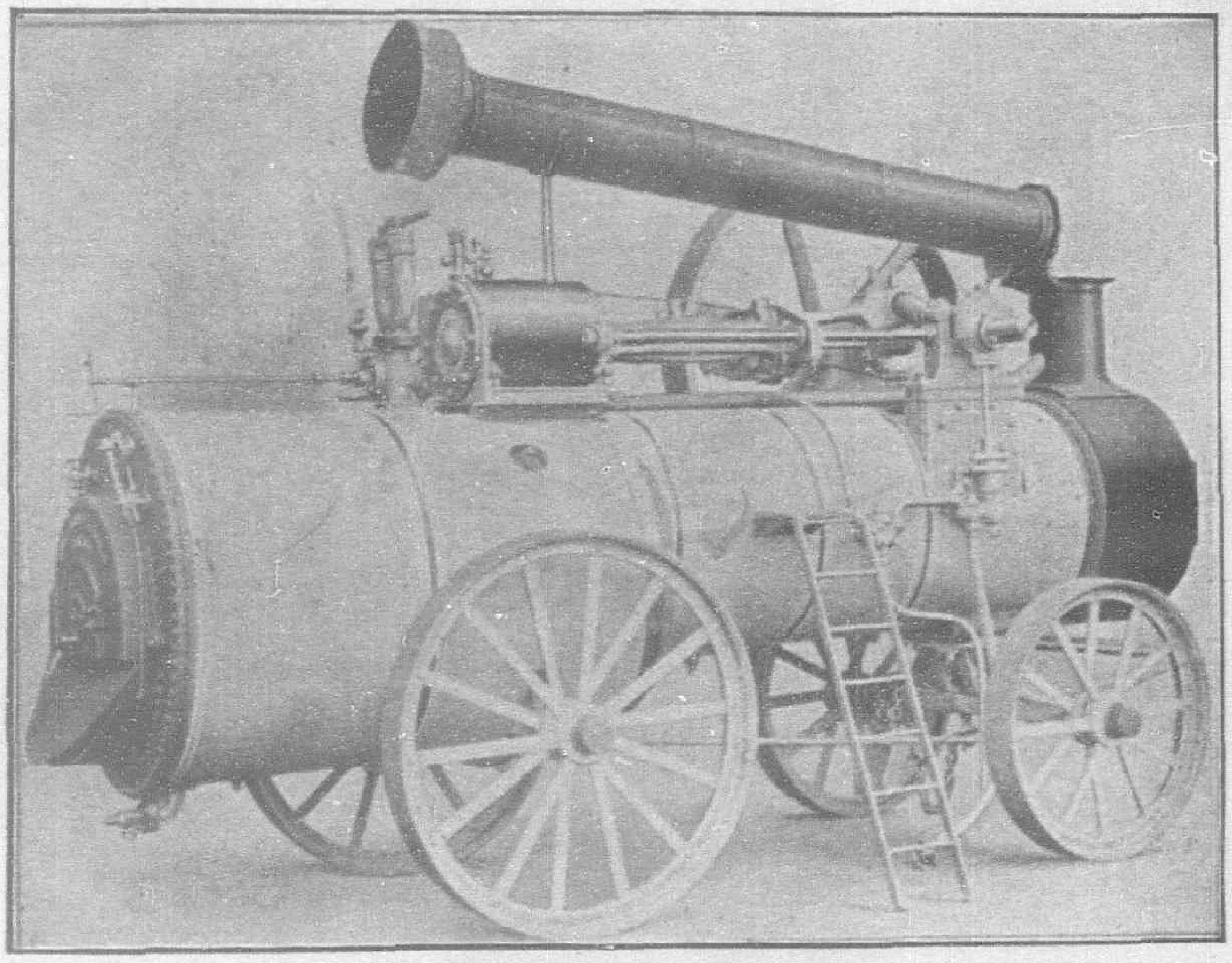

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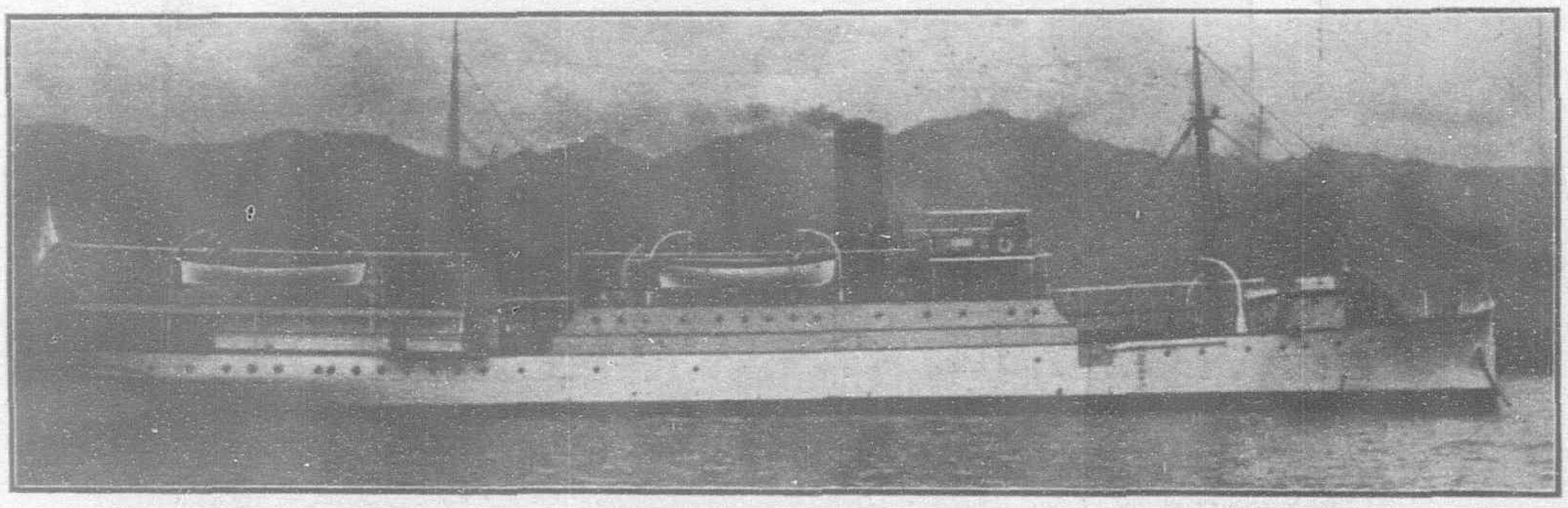

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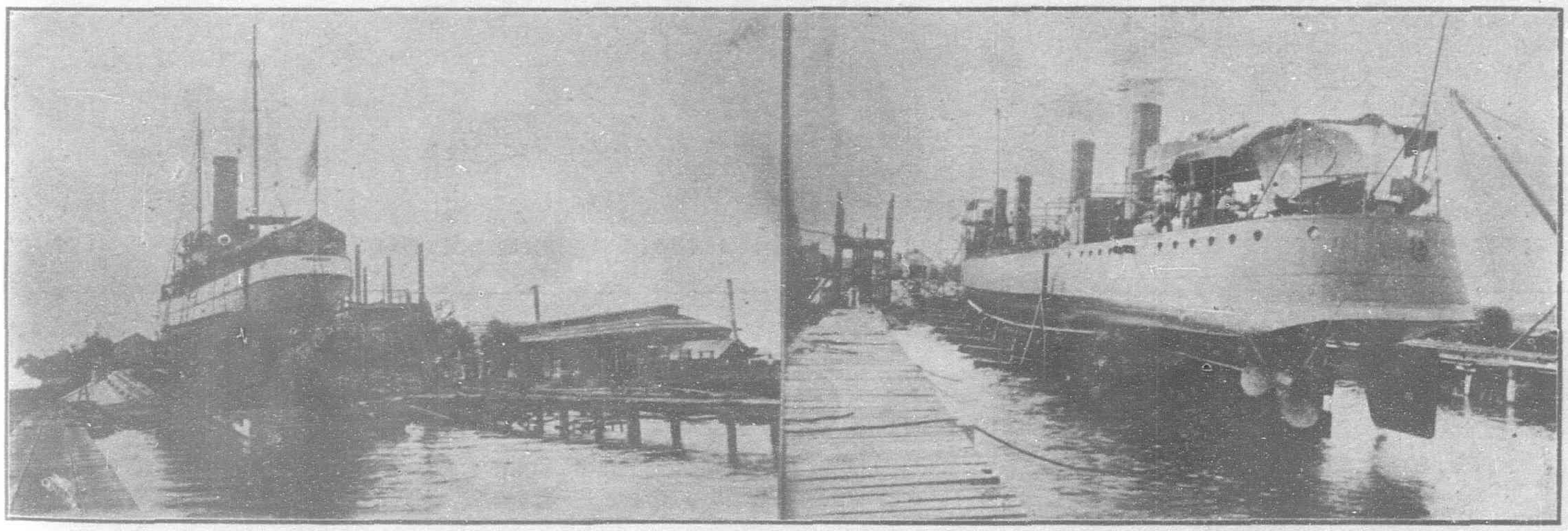

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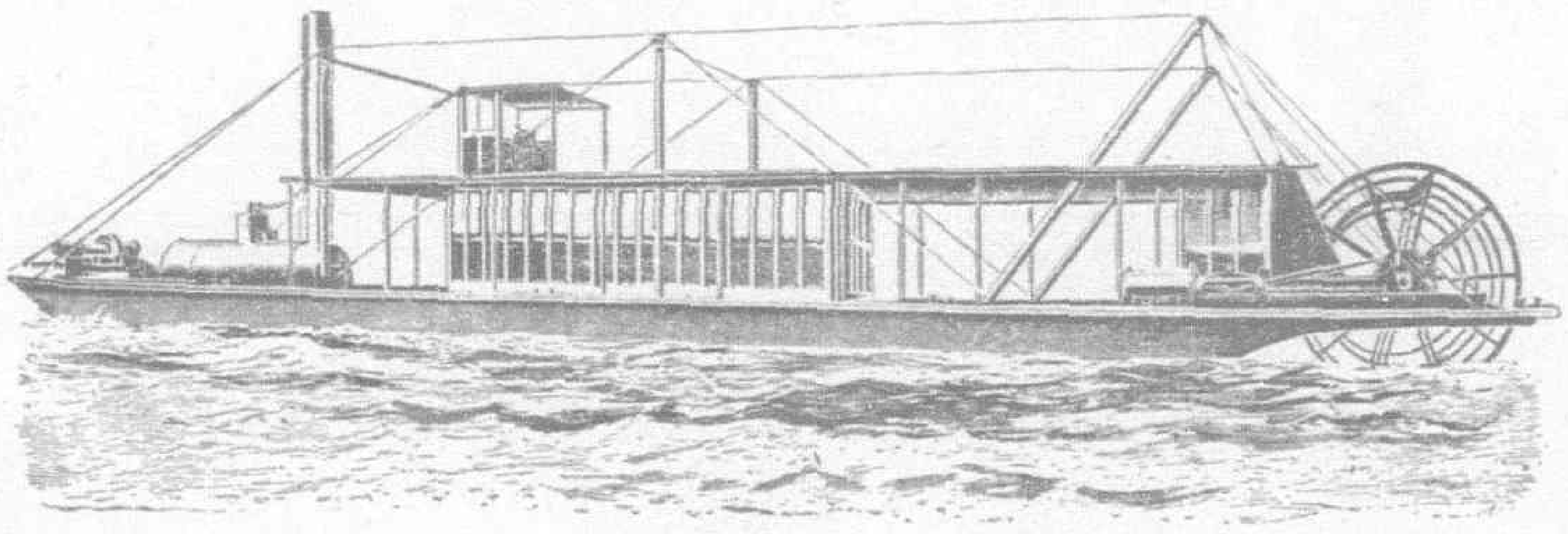

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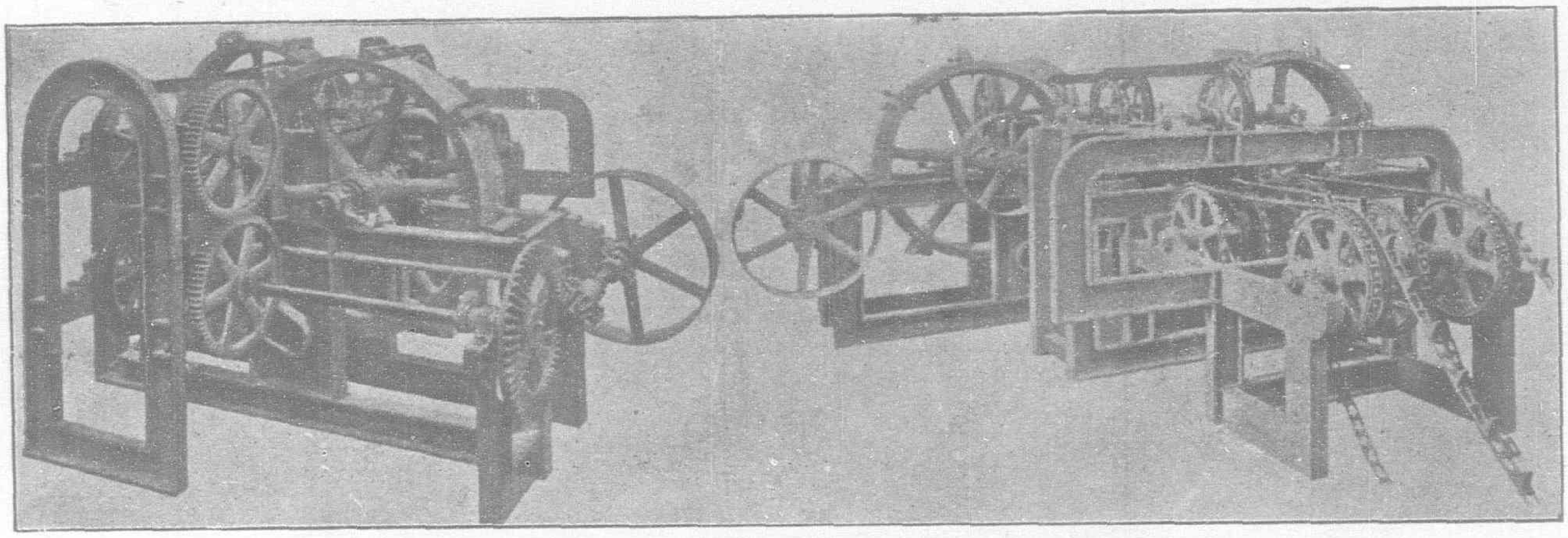

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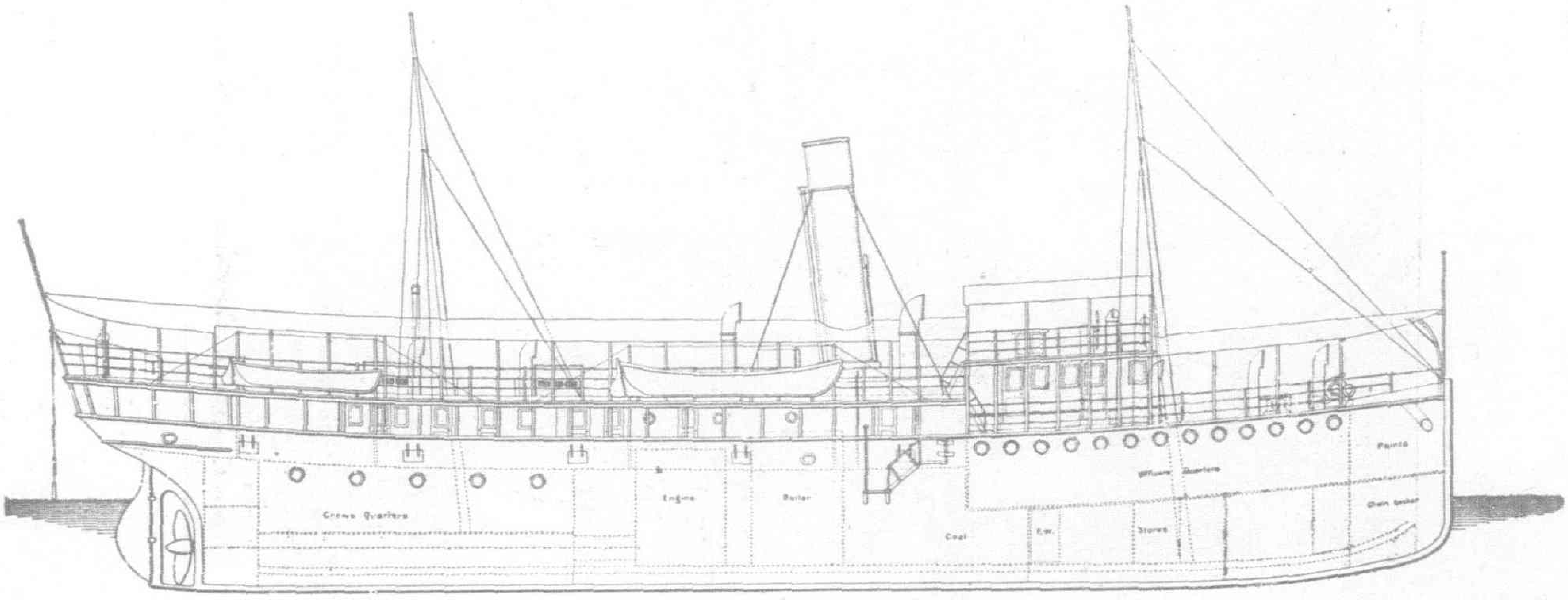

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The Company has SIX GRANITE DOCKS and TWO PATENT SLIPS of the following dimensions:—

NAME OF DOCK OR SLIP	LENGTH ON KEEL BLOCKS	BREADTH AT ENTRANCE	DEPTH OVER SILL AT ORDINARY SPRING TIDES	RISE OF TIDE	
				SPRINGS	NEAPS
KOWLOON	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
No. 1 Dock, Kowloon..........	576	86 feet top 70 ft. bottom	30′	7′ 6″	3
No. 2 Dock, Kowloon..........	371	74′	18′ 6″	7′ 6″	—
No. 3 Dock, Kowloon..........	264	49′ 3″	14′	7′ 6″	—
Patent Slip, No. 1, Kowloon...	240	60′	14′	7′ 6″	—
Patent Slip, No. 2, Kowloon...	220	60′	12′	7′ 6″	—
TAI-KOK-TSUI					
Cosmopolitan Dock...........	466	85′ 6″	20′	7′ 6″	—
ABERDEEN					
Hope Dock..................	430	84′	23′	7′ 6″	—
Lamont Dock................	333	64′	16′	7′ 6″	—

The DOCKS are fitted with every appliance in the way of Caissons powerful Centrifugal Steam Pumps, etc., which enable them to be pumped out in three hours.

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Powerful Lifting Shears with steam purchase at two of their Establishments stand on a solid granite seawall, alongside which vessels can lie drawing 24 feet of water, and take in or out boilers, etc. The Shears at Kowloon are capable of lifting 70 tons.

The Company is prepared to tender for the construction of new vessels in either steel, iron or wood, having already built about 400 of varying sizes up to 3,000 tons; also to execute all kinds of ship work at lower rates and with greater despatch than any establishment in the East. Every department is under the close supervision of experienced European foremen.

SHIP-YARD is fully equipped with modern plant, including hydraulic flanging and bending machines, electrically driven rolls, punching, shearing, angle-bevelling, joggling and planing machines, capable of dealing with the heaviest class of work.

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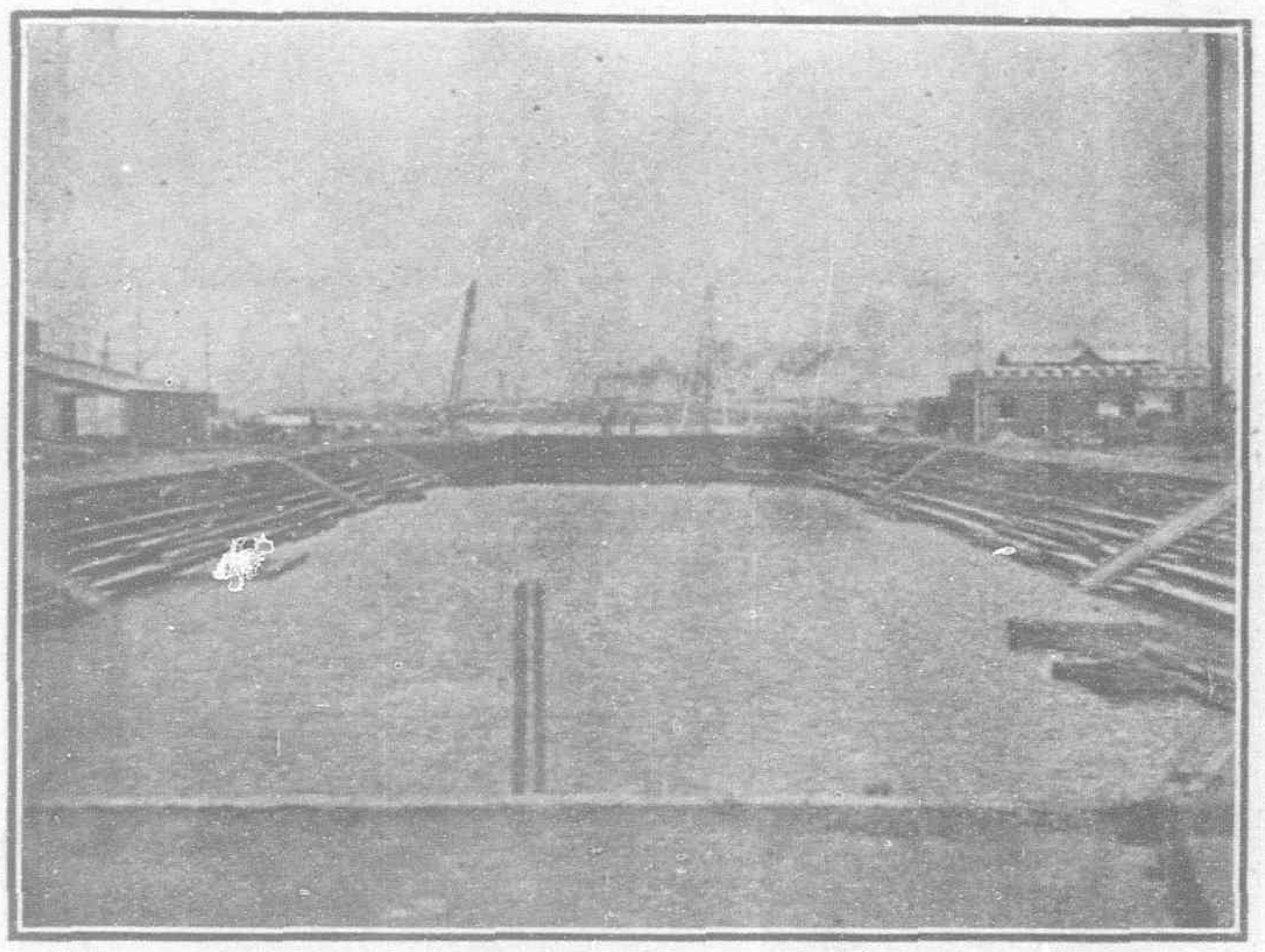
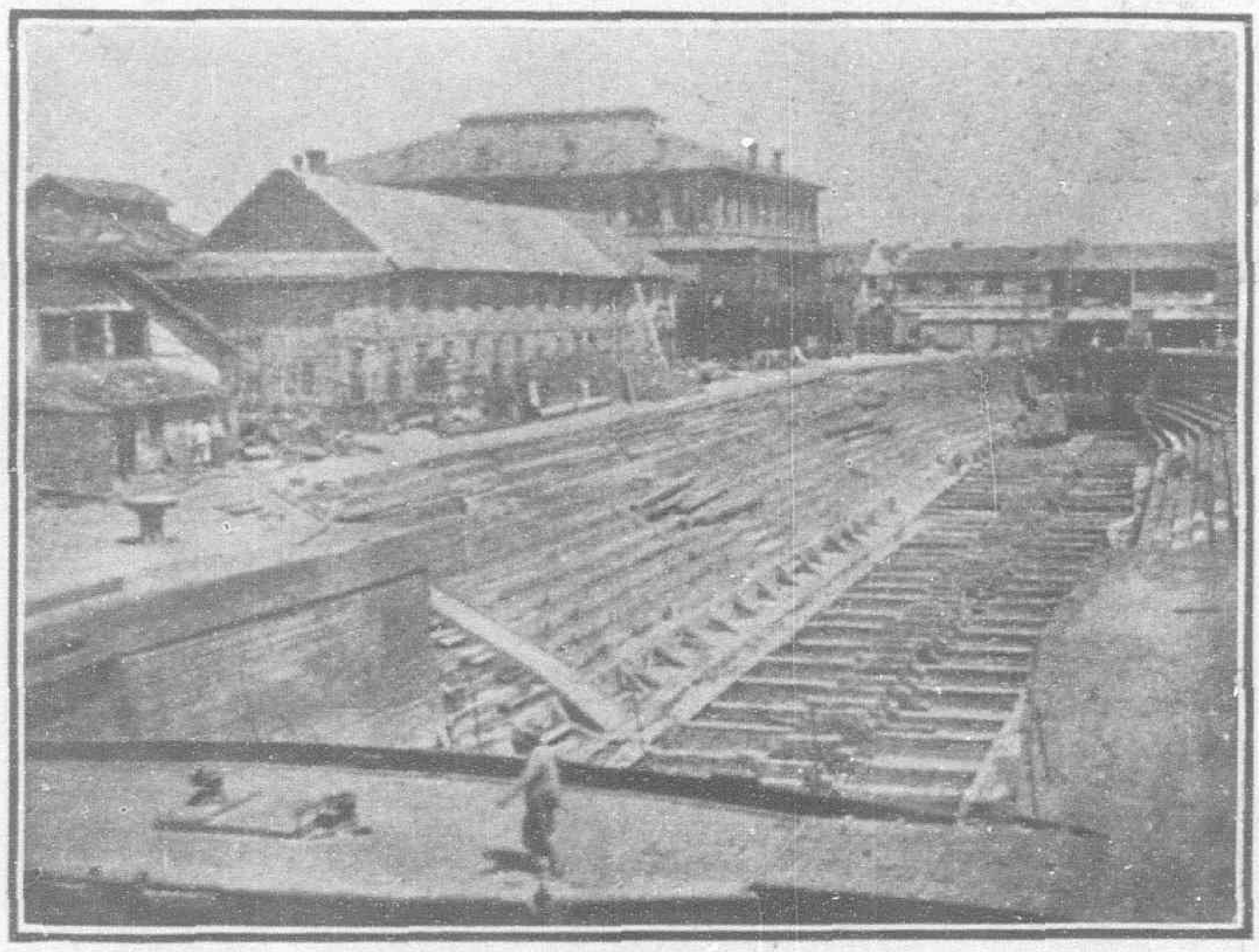


COSMOPOLITAN DOCK AT POOTUNG



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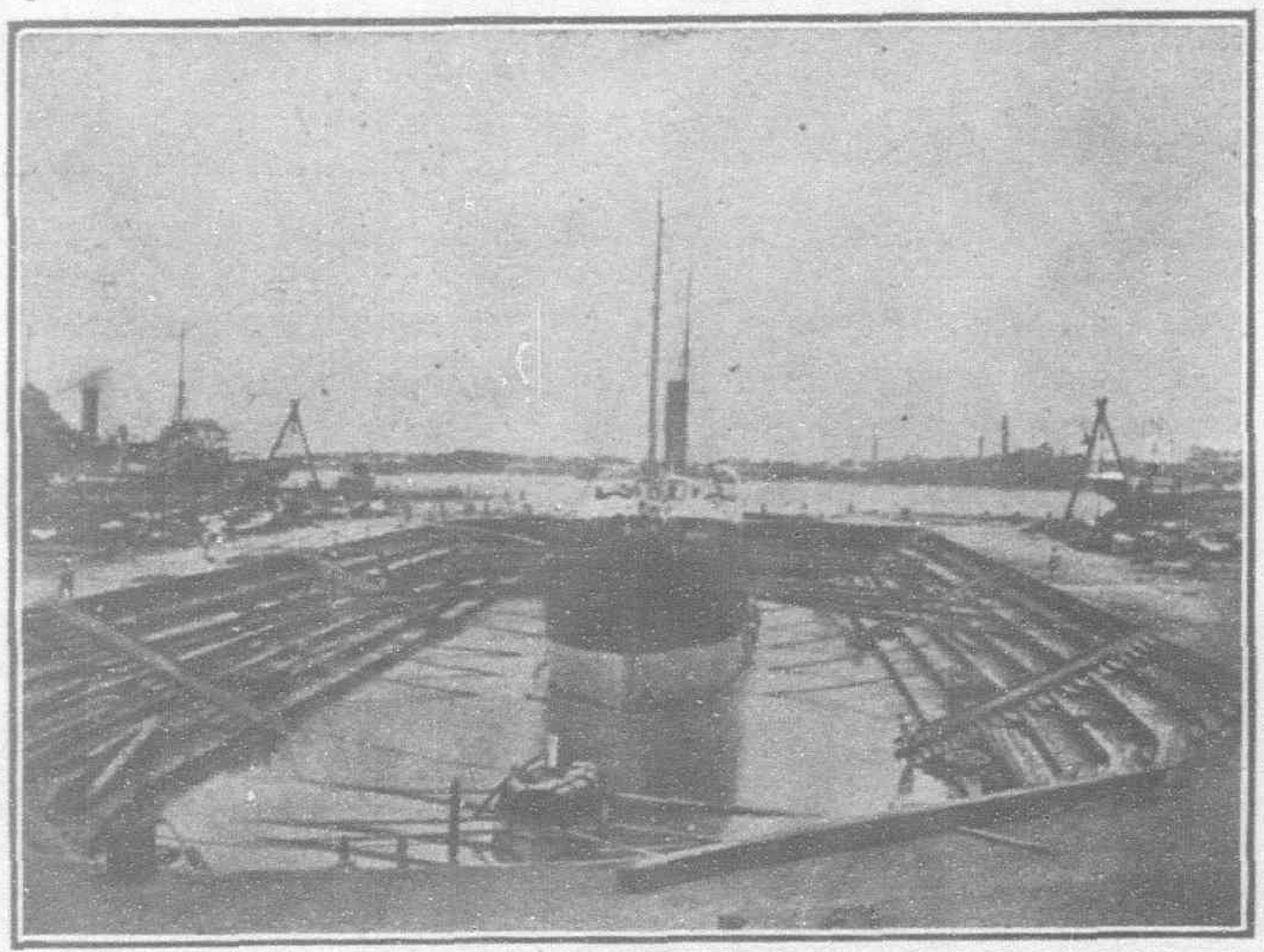

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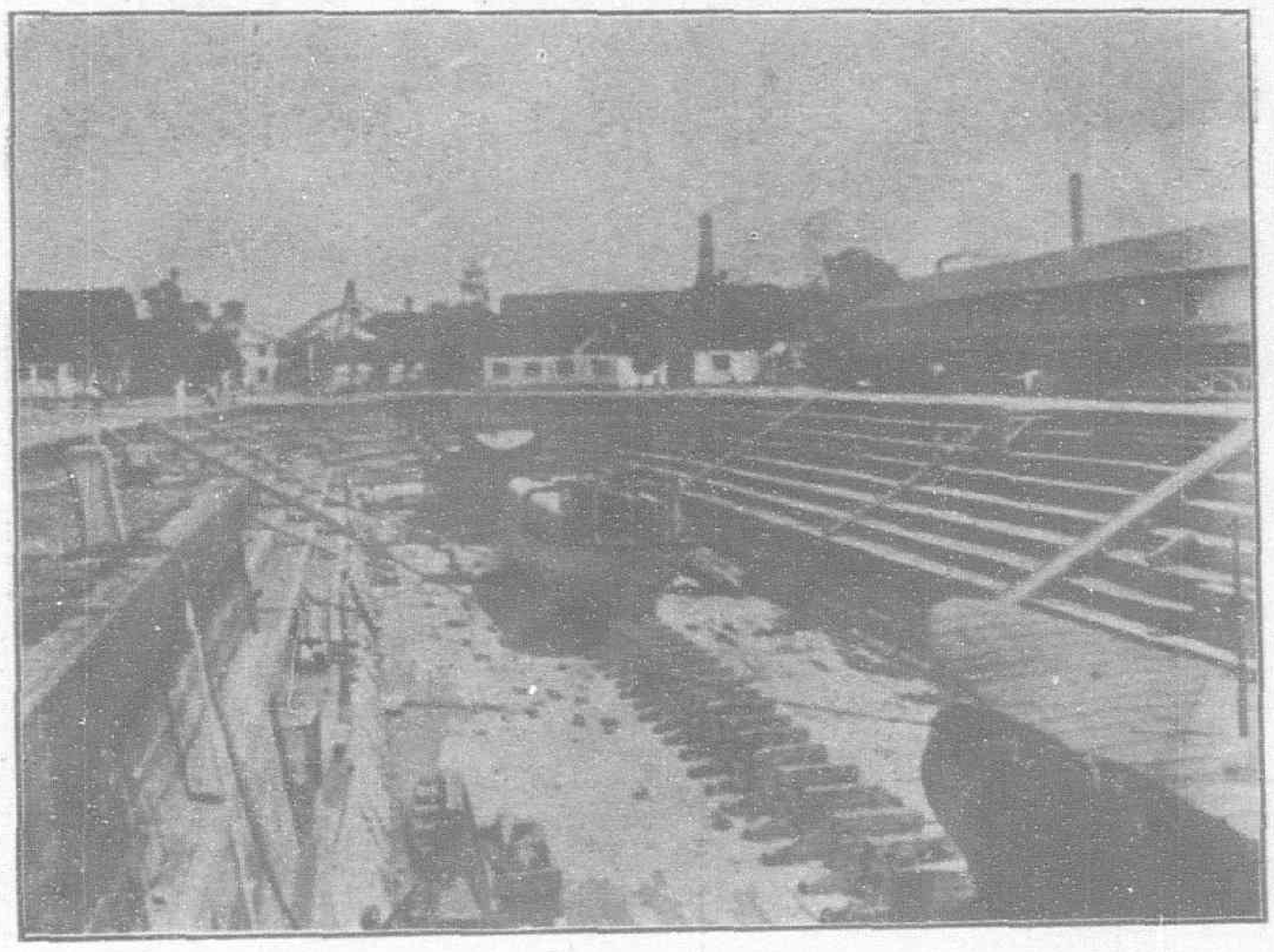

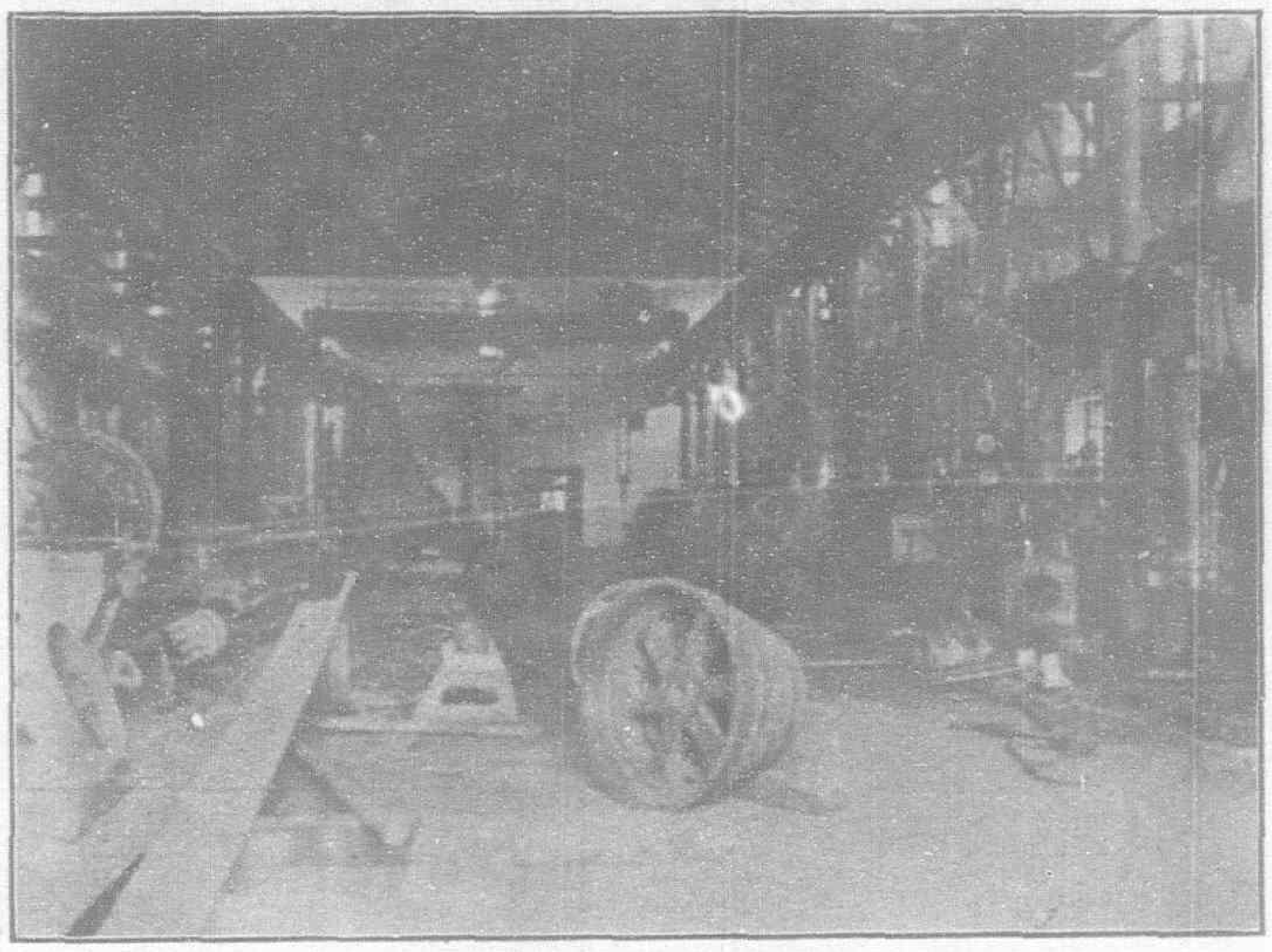

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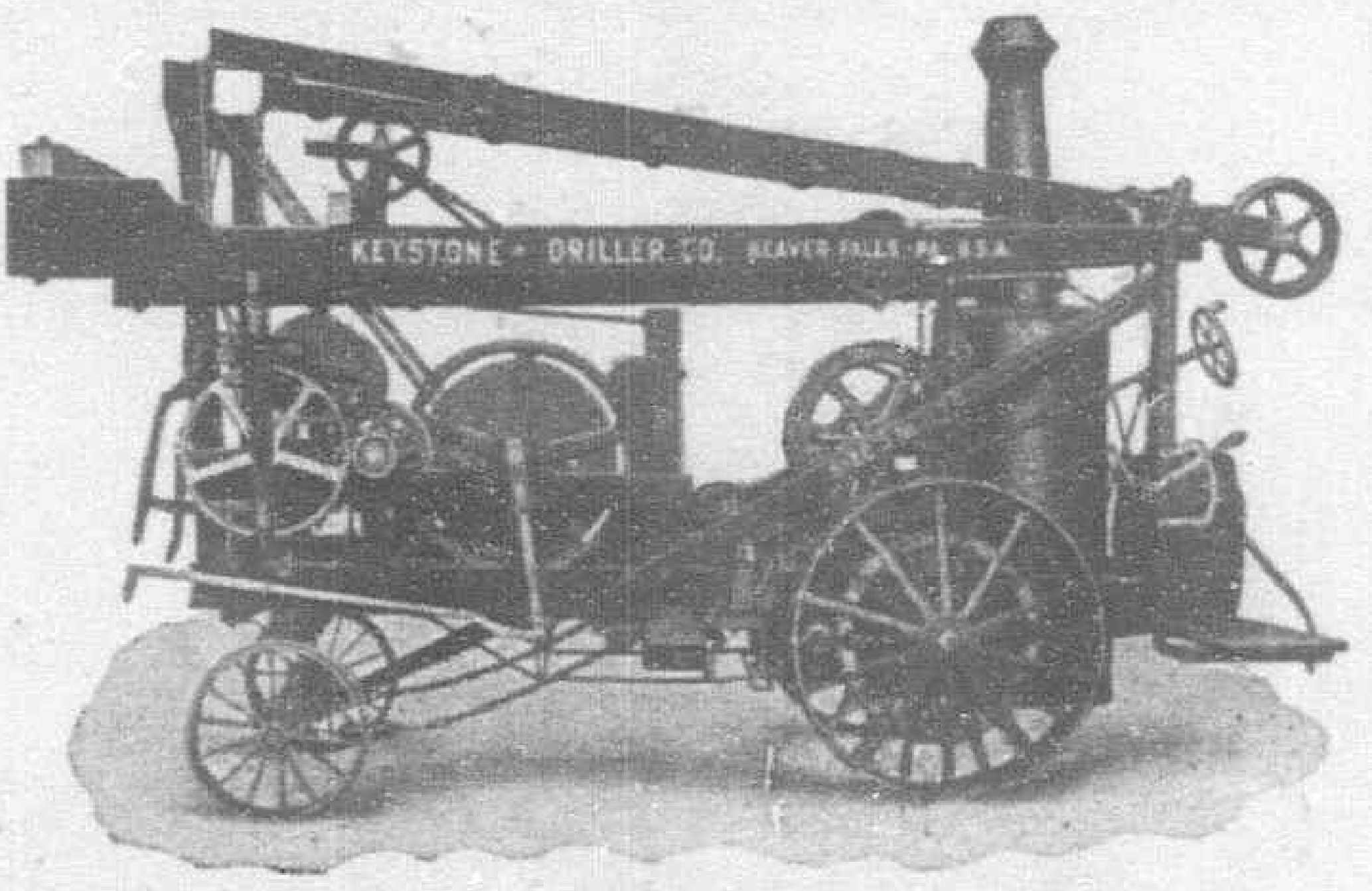
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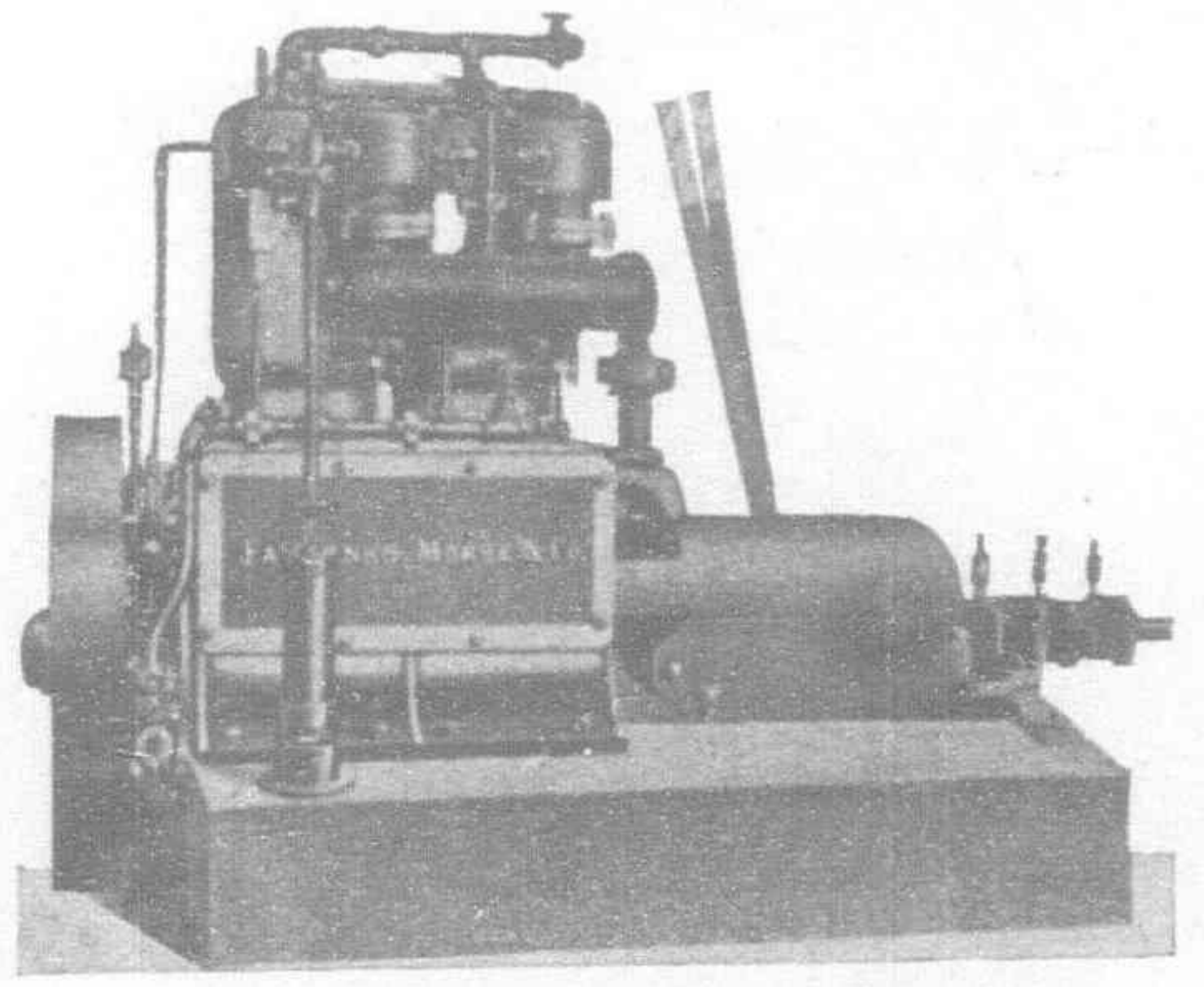

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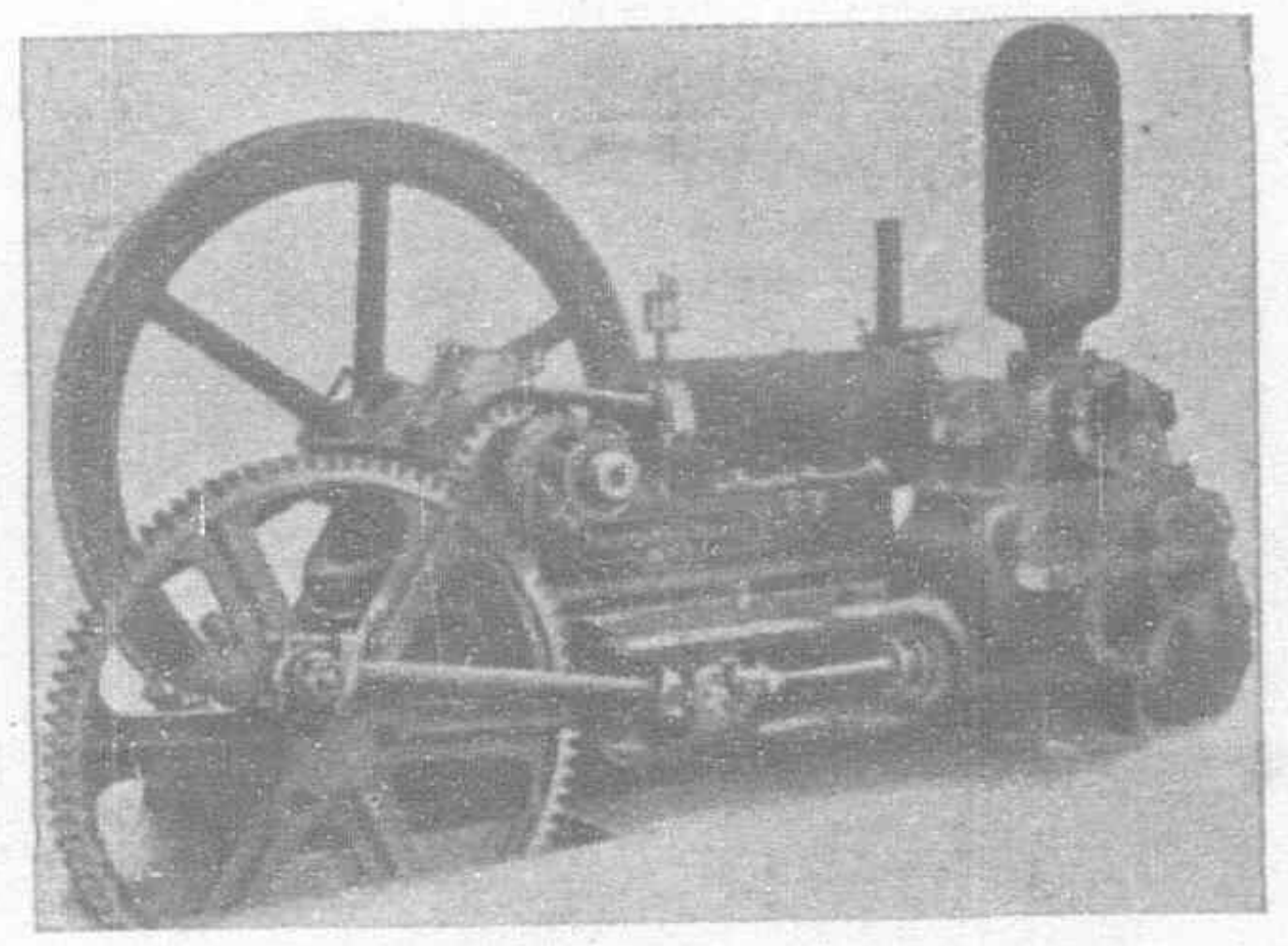

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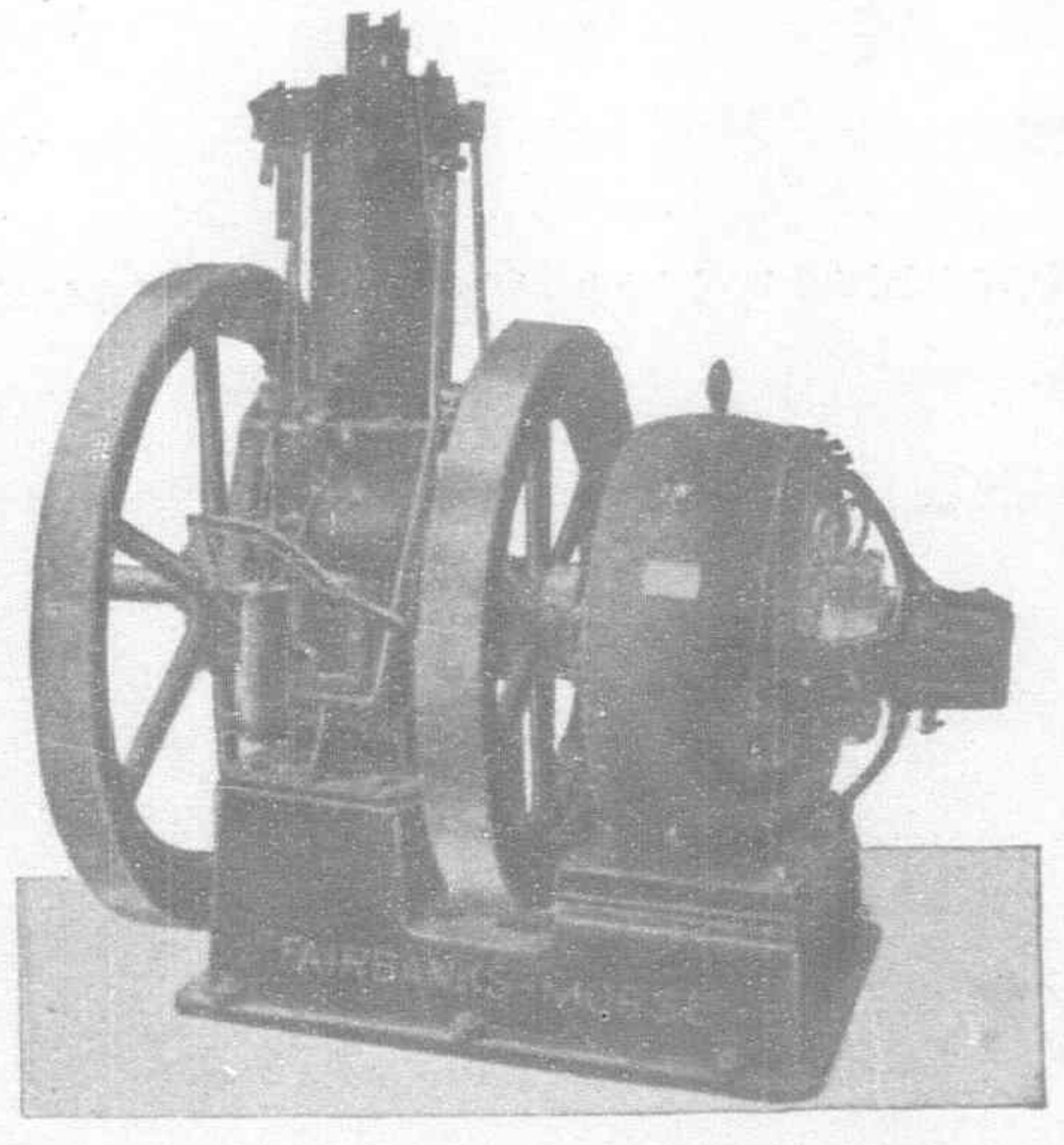

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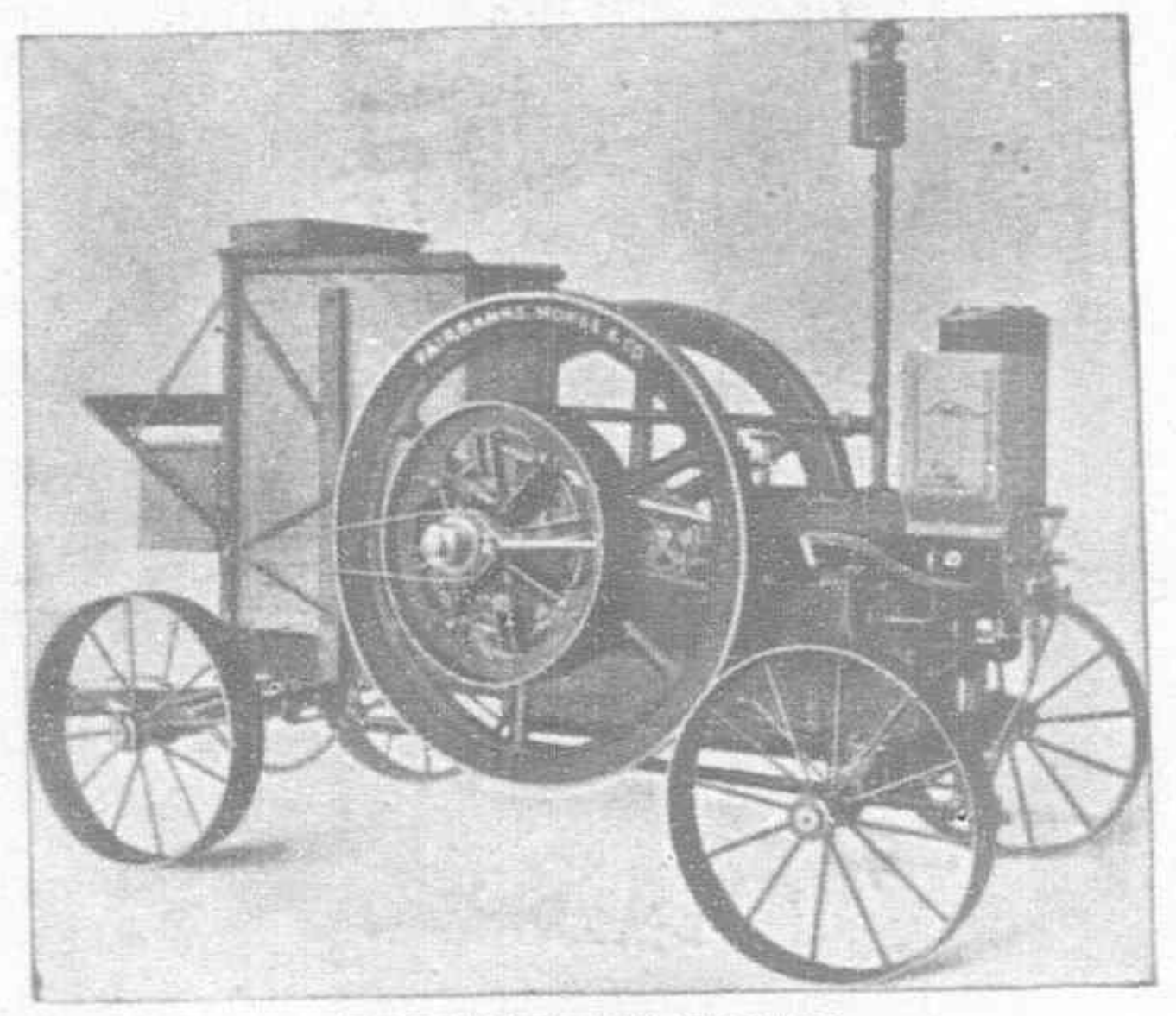

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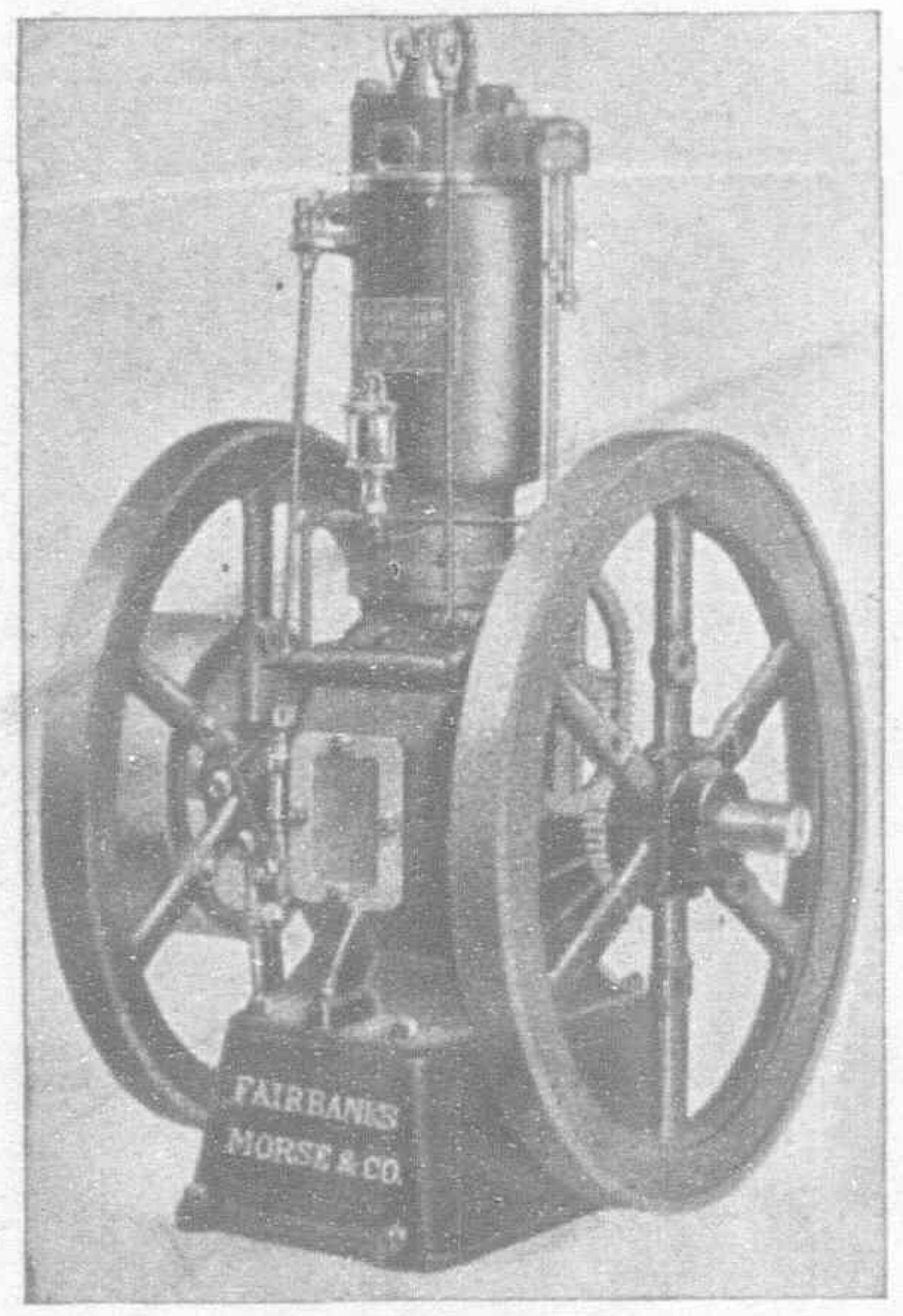

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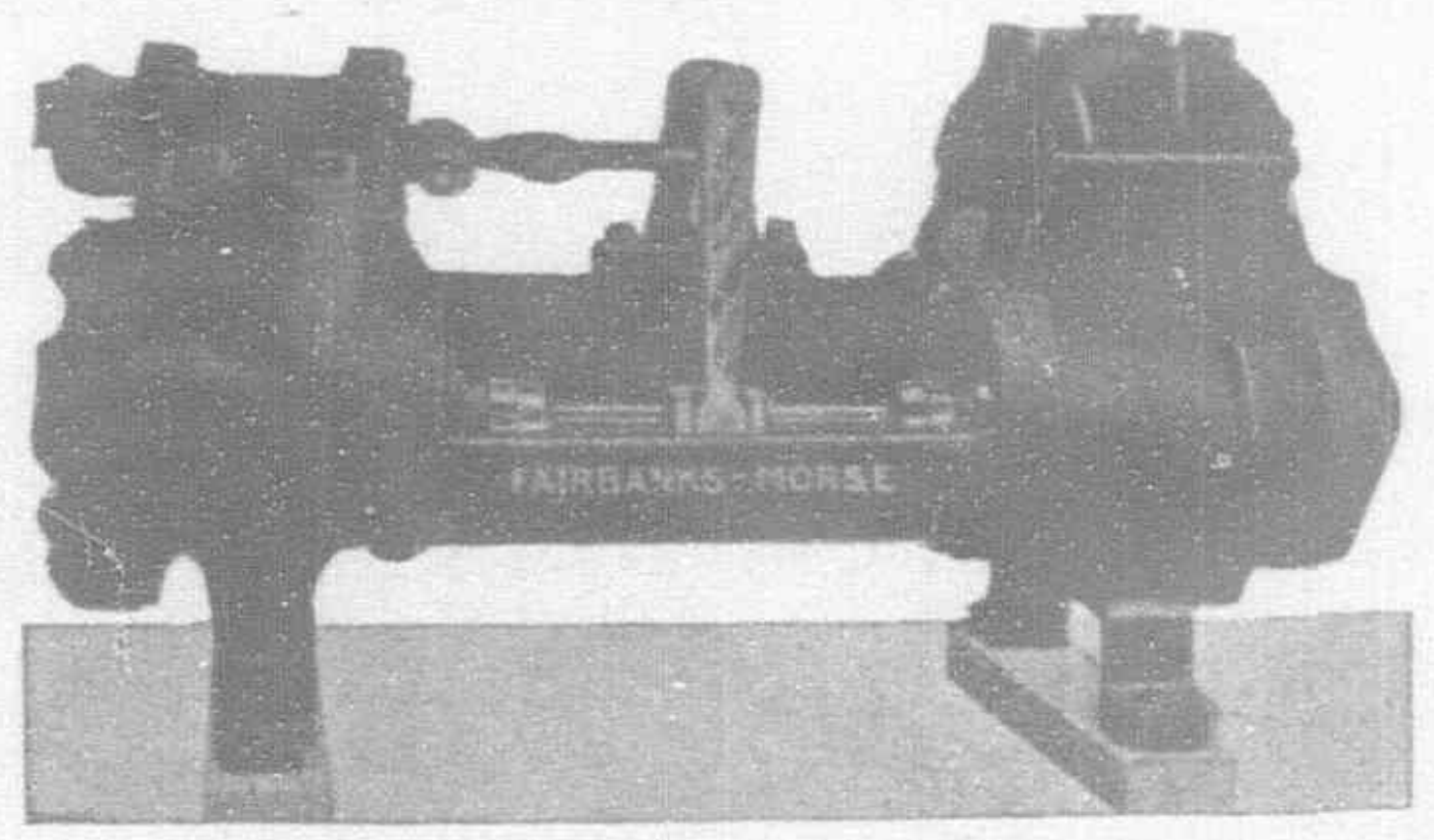

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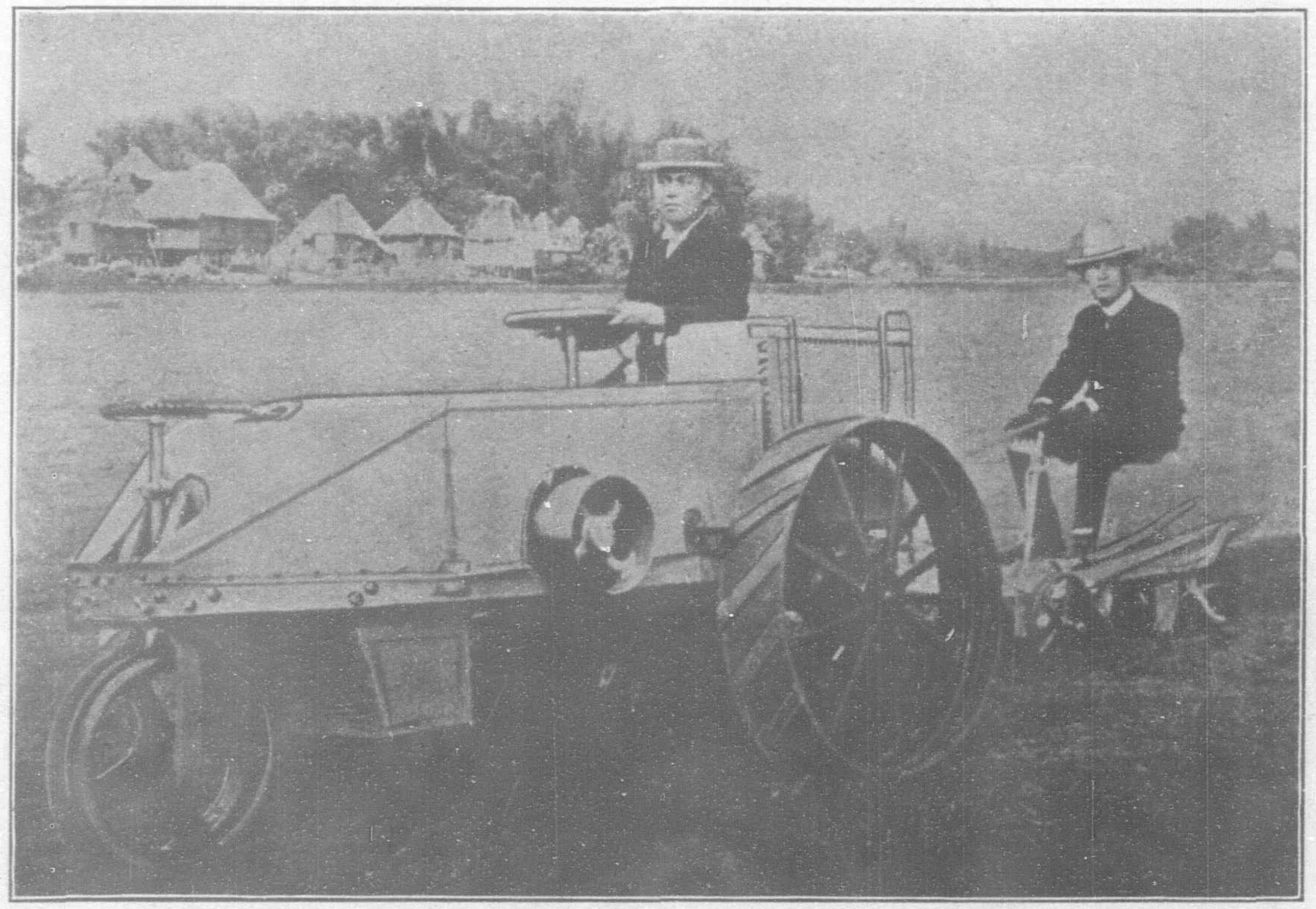

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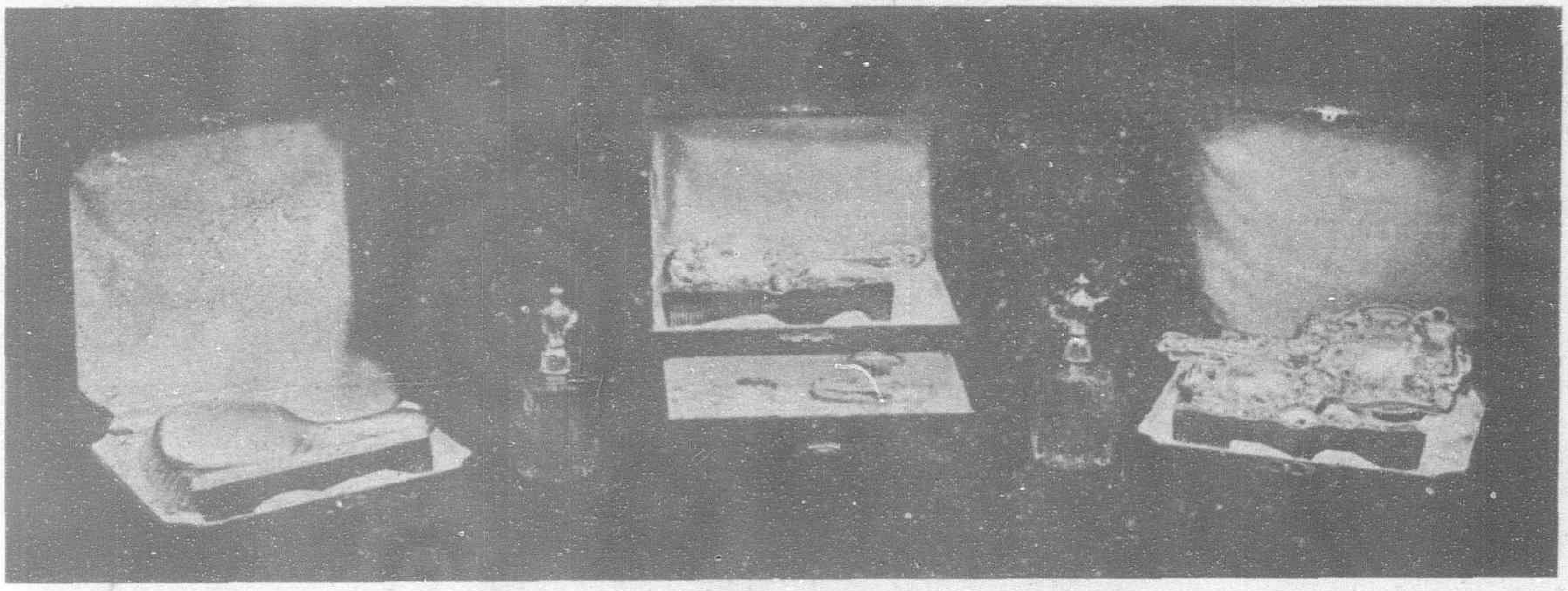

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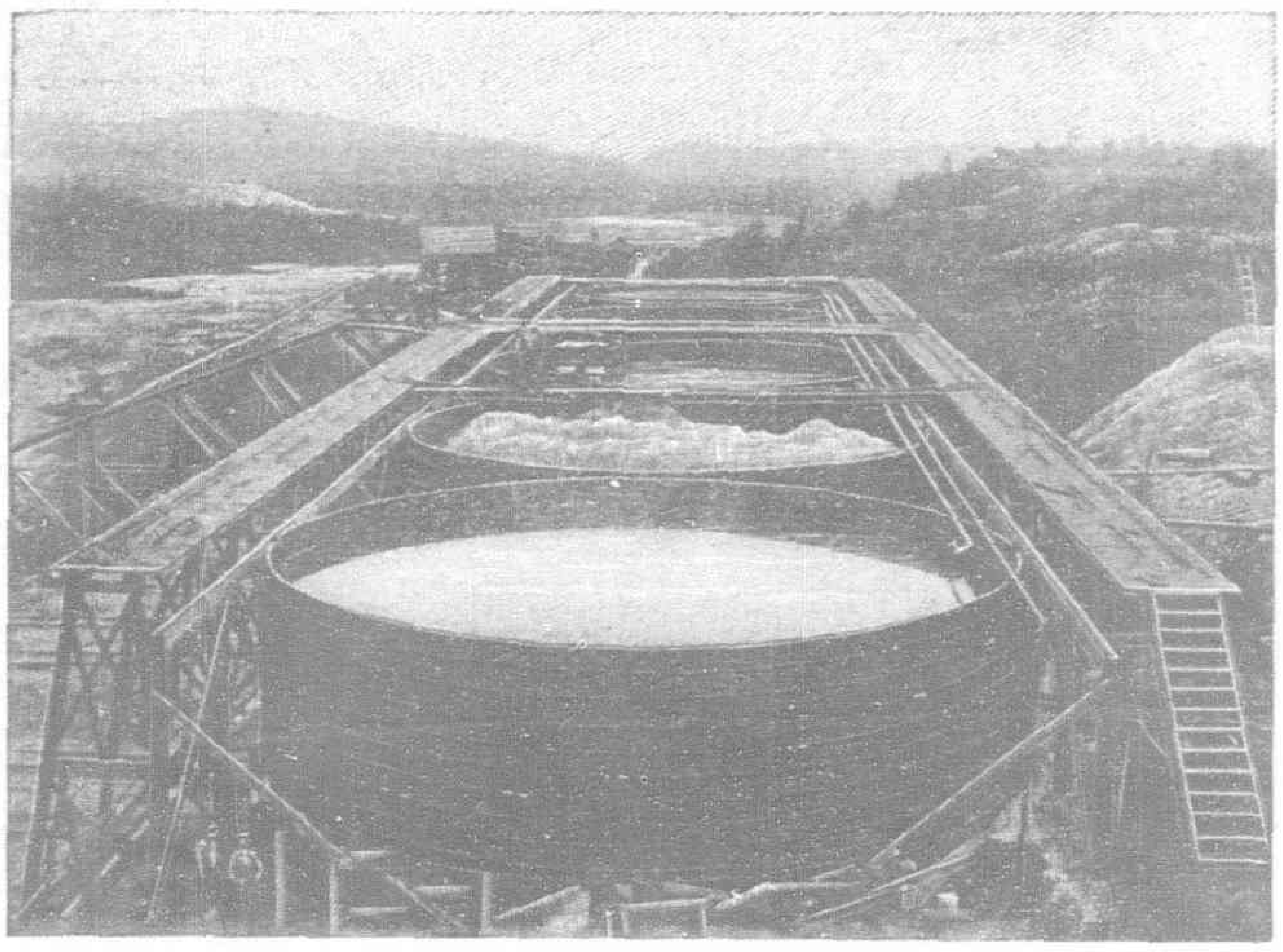

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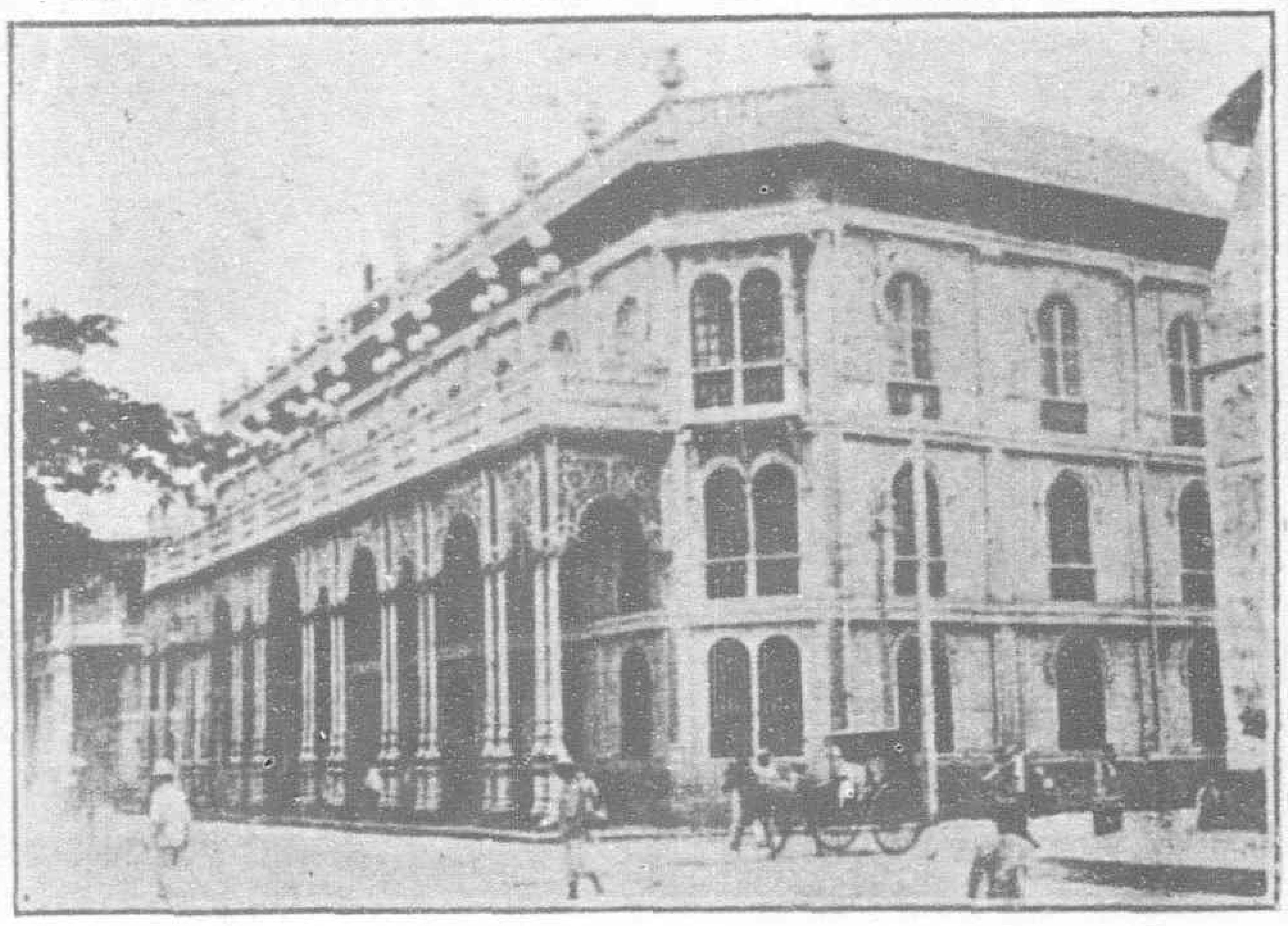

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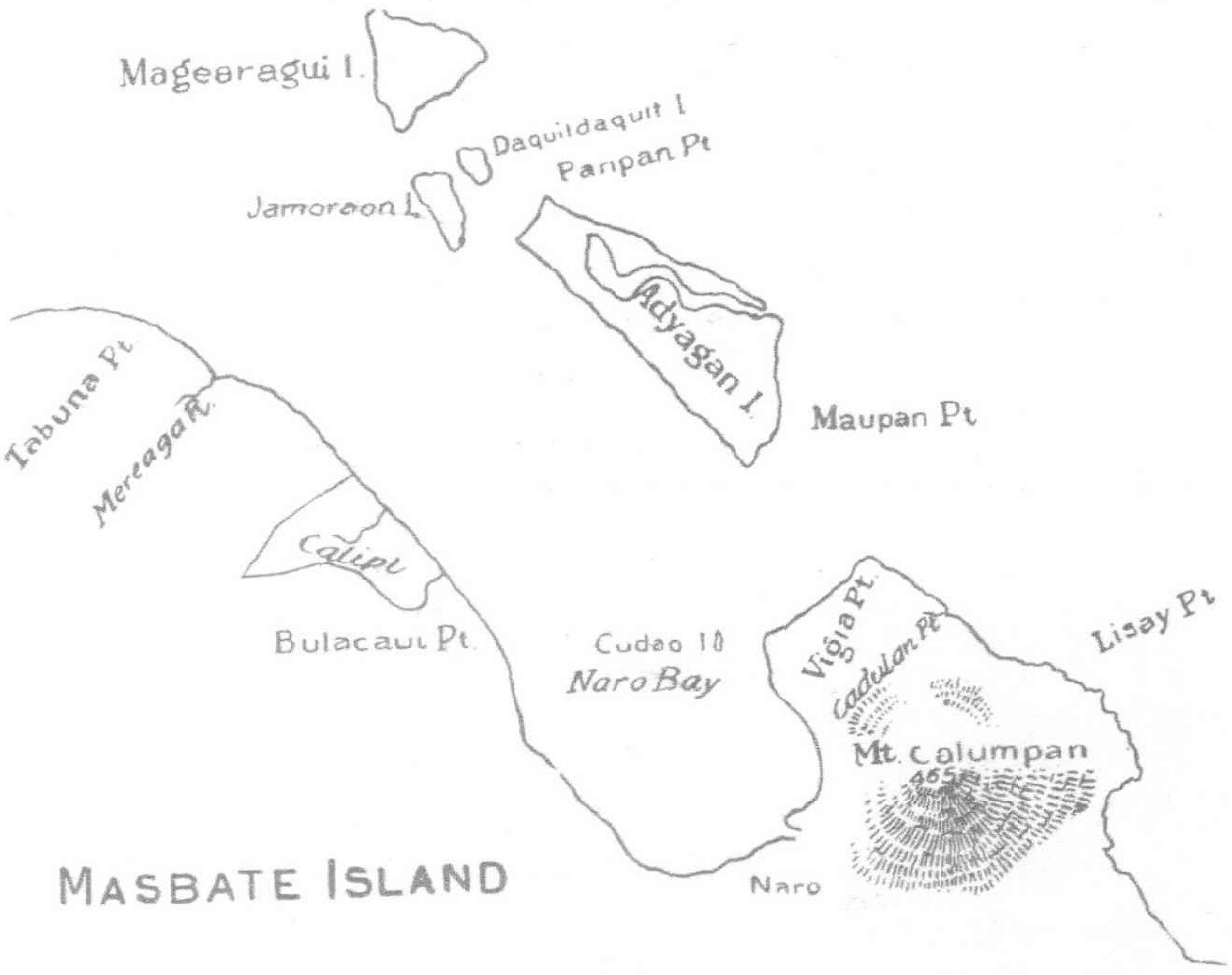

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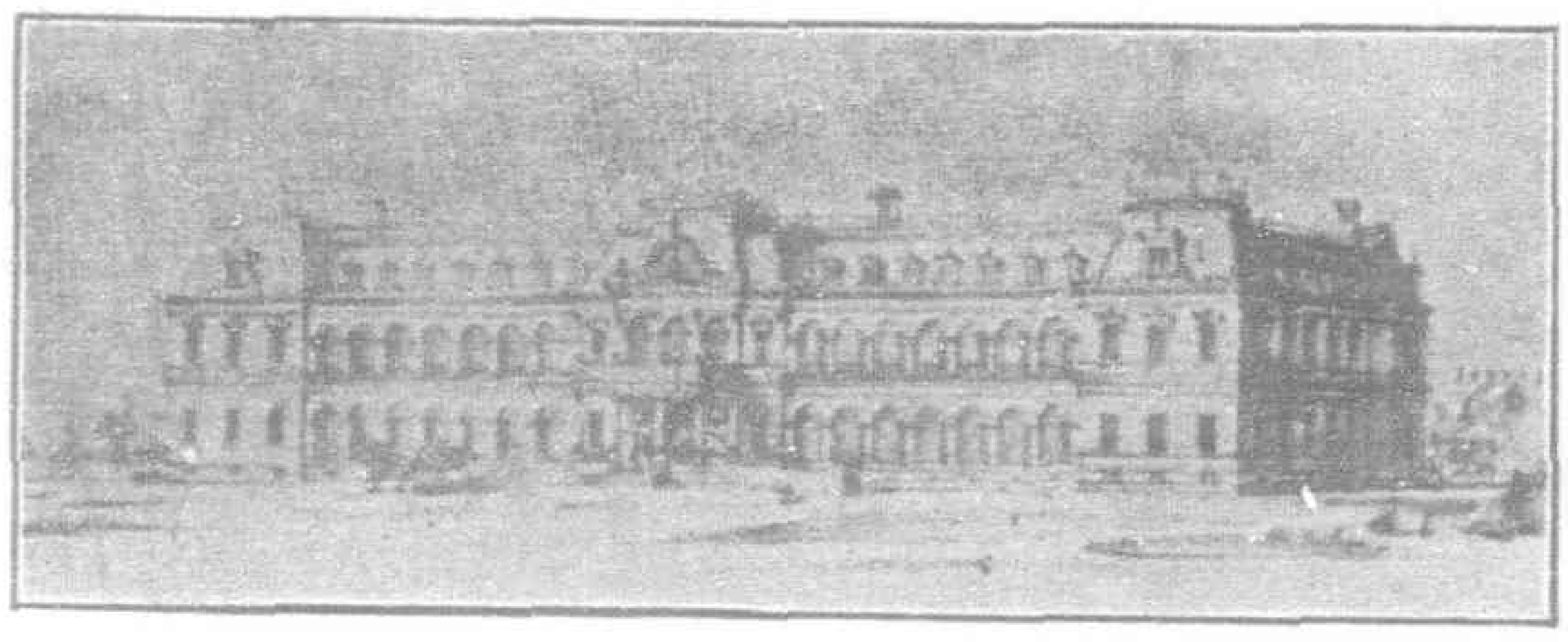

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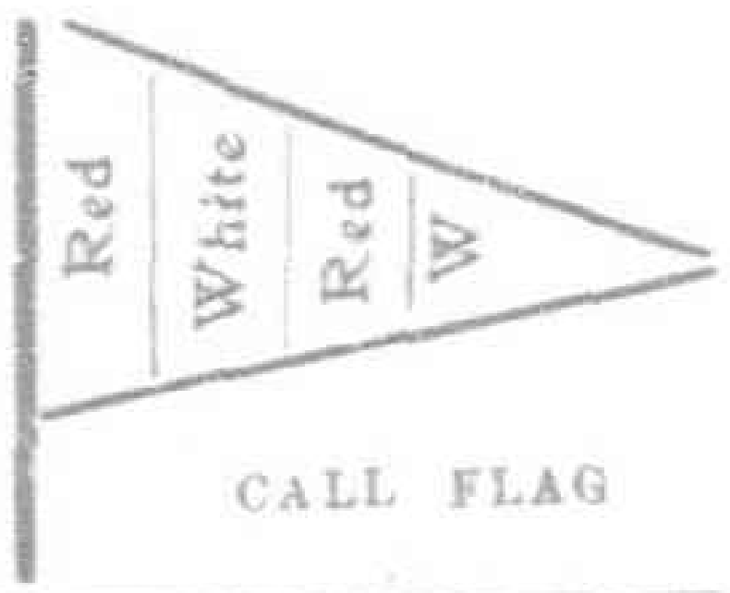

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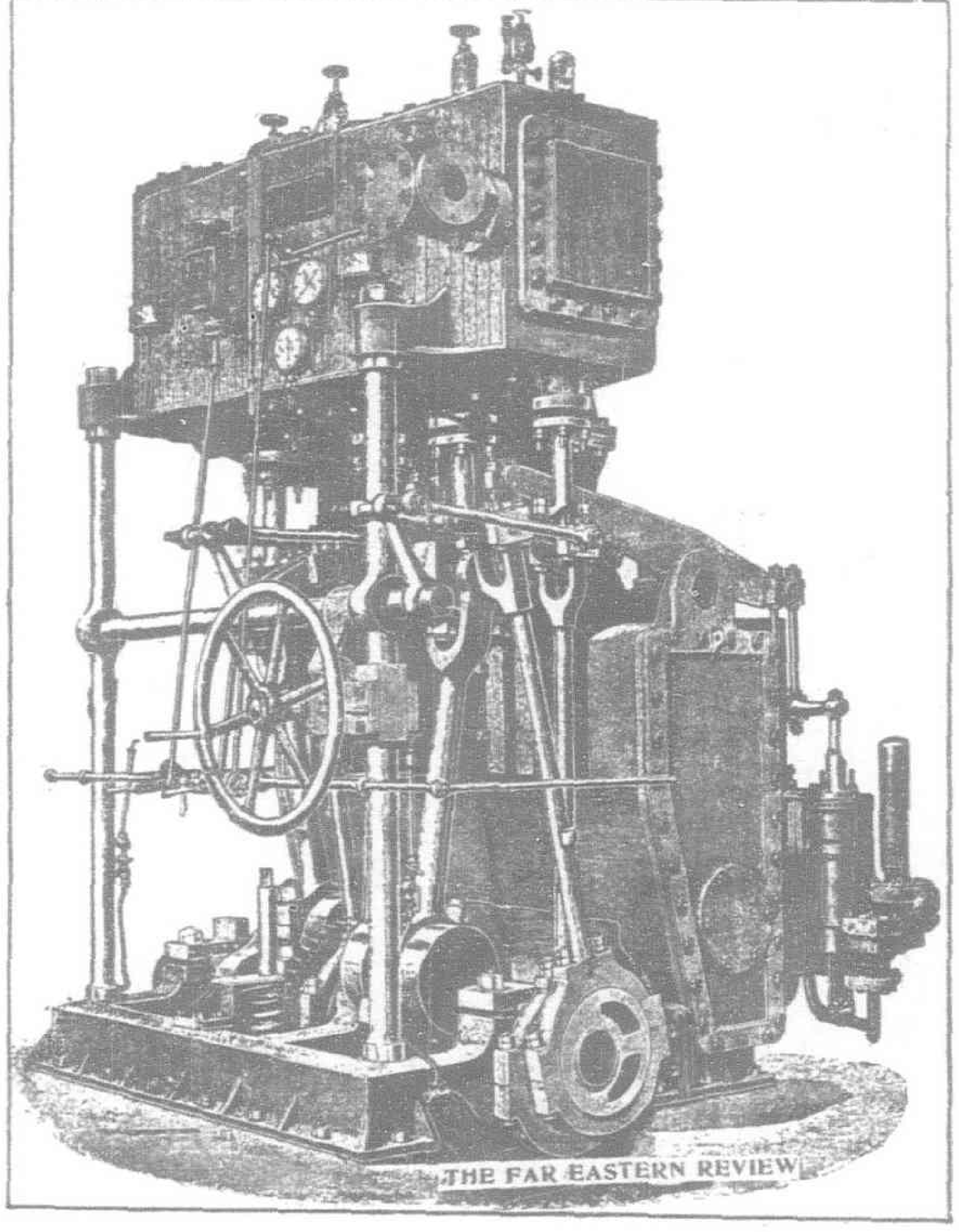

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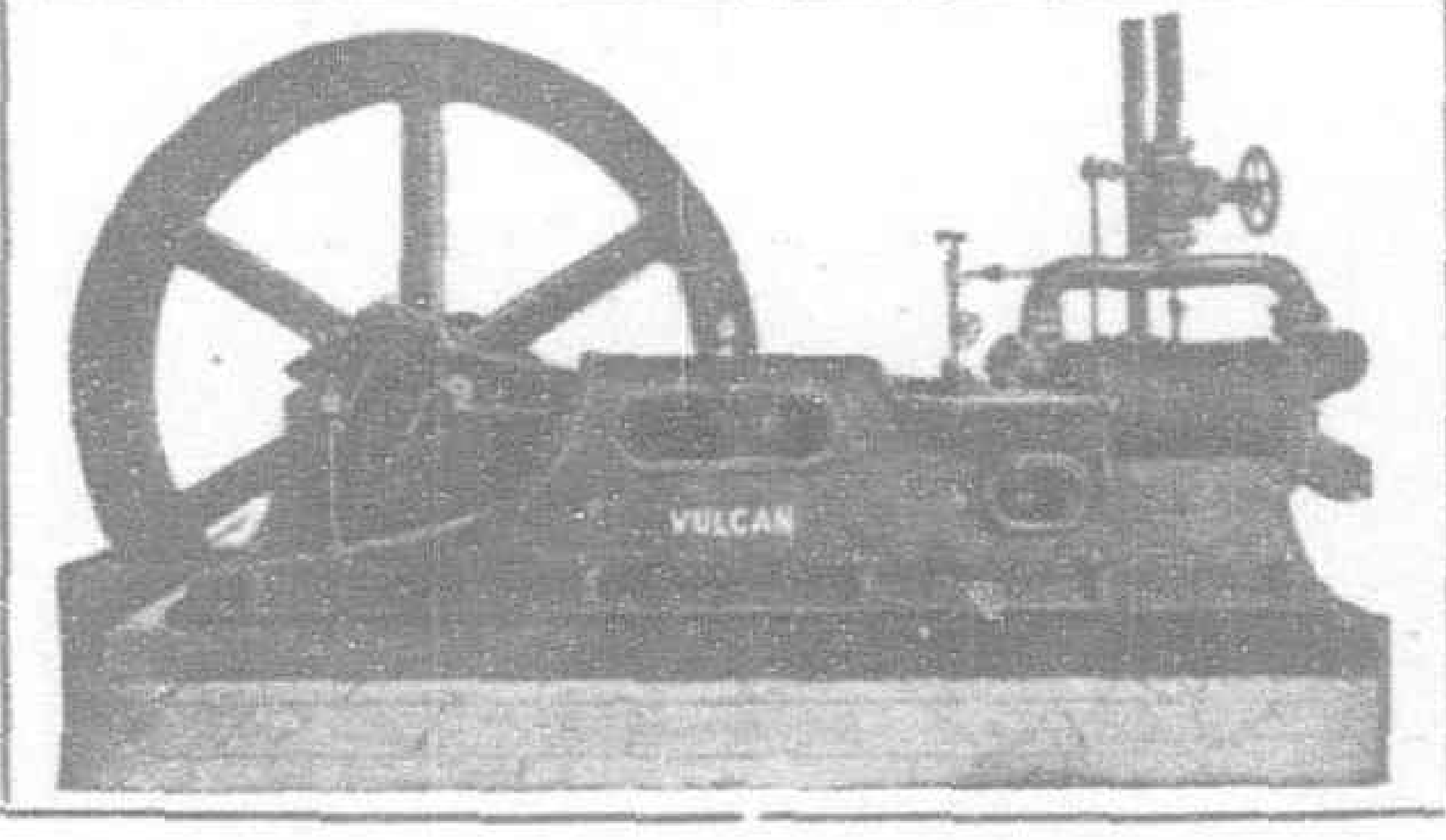

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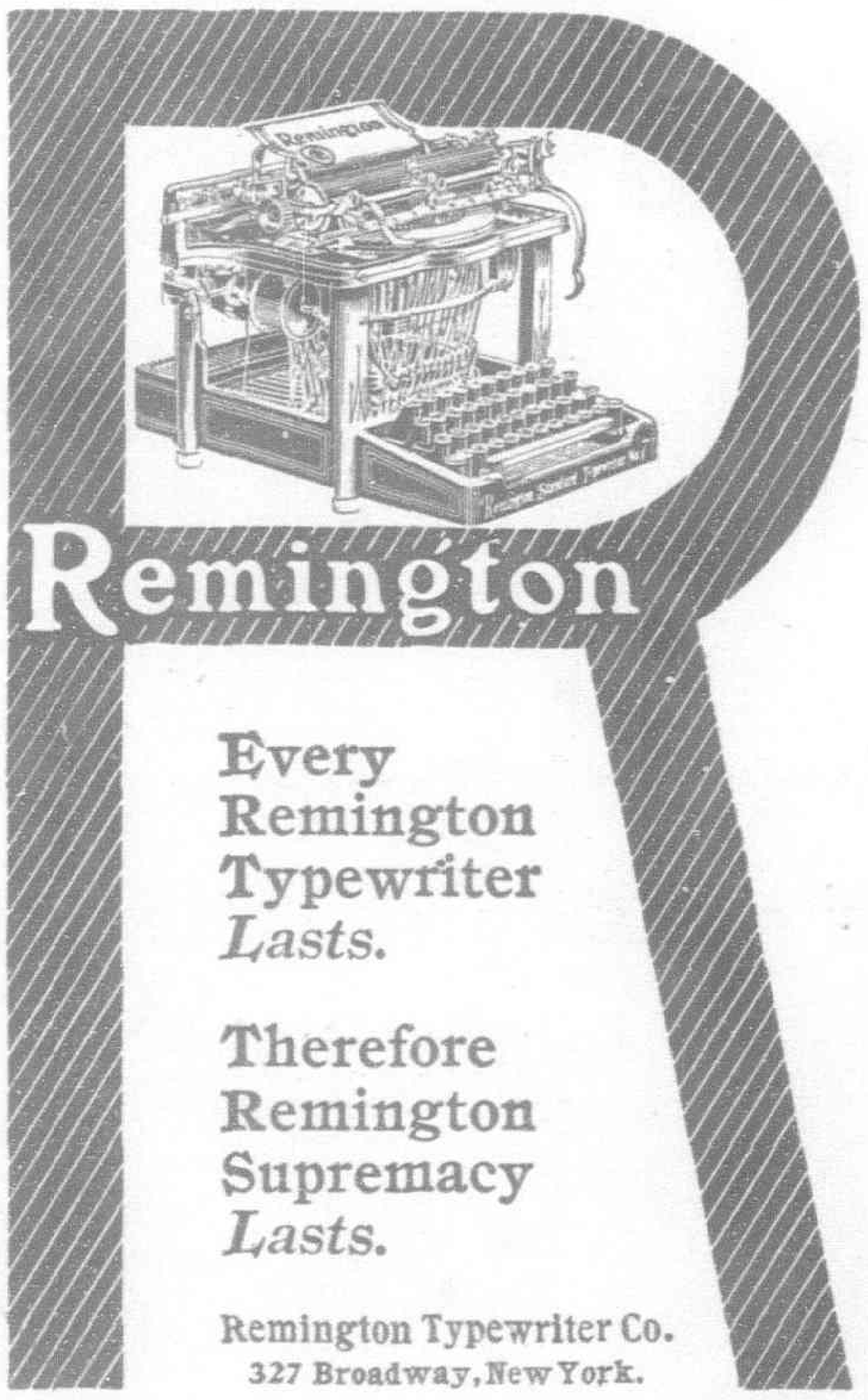

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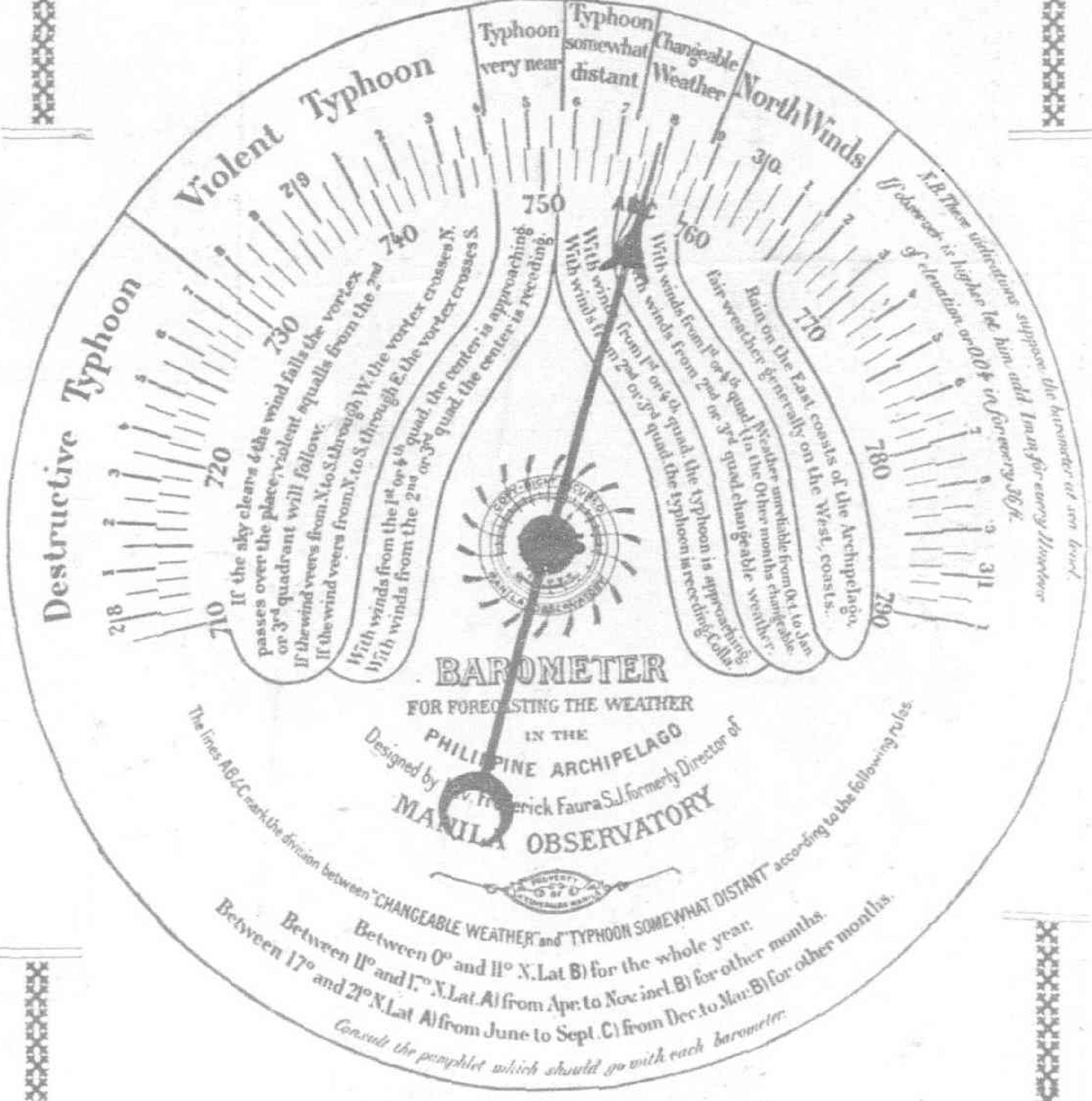
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Vol. I. DECEMBER, 1906 No. 10.

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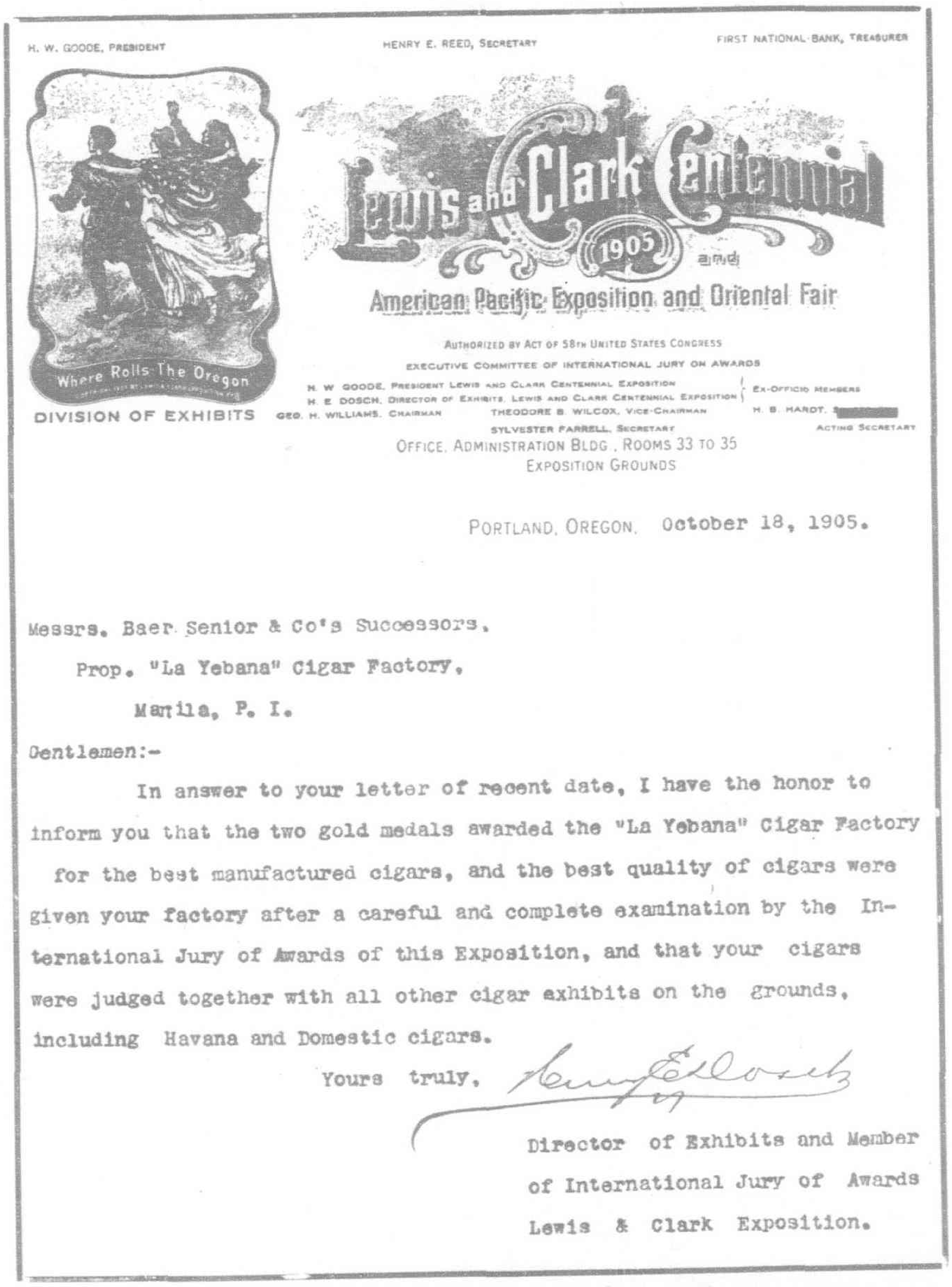

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EXECUTIVE COMMITTEE OF INTERNATIONAL JURY ON AWARDS

H. W. GOODE, PRESIDENT LEWIS AND CLARK CENTENNIAL EXPOSITION
H. E. DOSCH, DIRECTOR OF EXHIBITS, LEWIS AND CLARK CENTENNIAL EXPOSITION } EX-OFFICIO MEMBERS
GEO. H. WILLIAMS, CHAIRMAN THEODORE B. WILCOX, VICE-CHAIRMAN H. B. HARDT, [redacted]
SYLVESTER FARRELL, SECRETARY ACTING SECRETARY

OFFICE, ADMINISTRATION BLDG., ROOMS 33 TO 35
EXPOSITION GROUNDS

PORTLAND, OREGON, October 18, 1905.

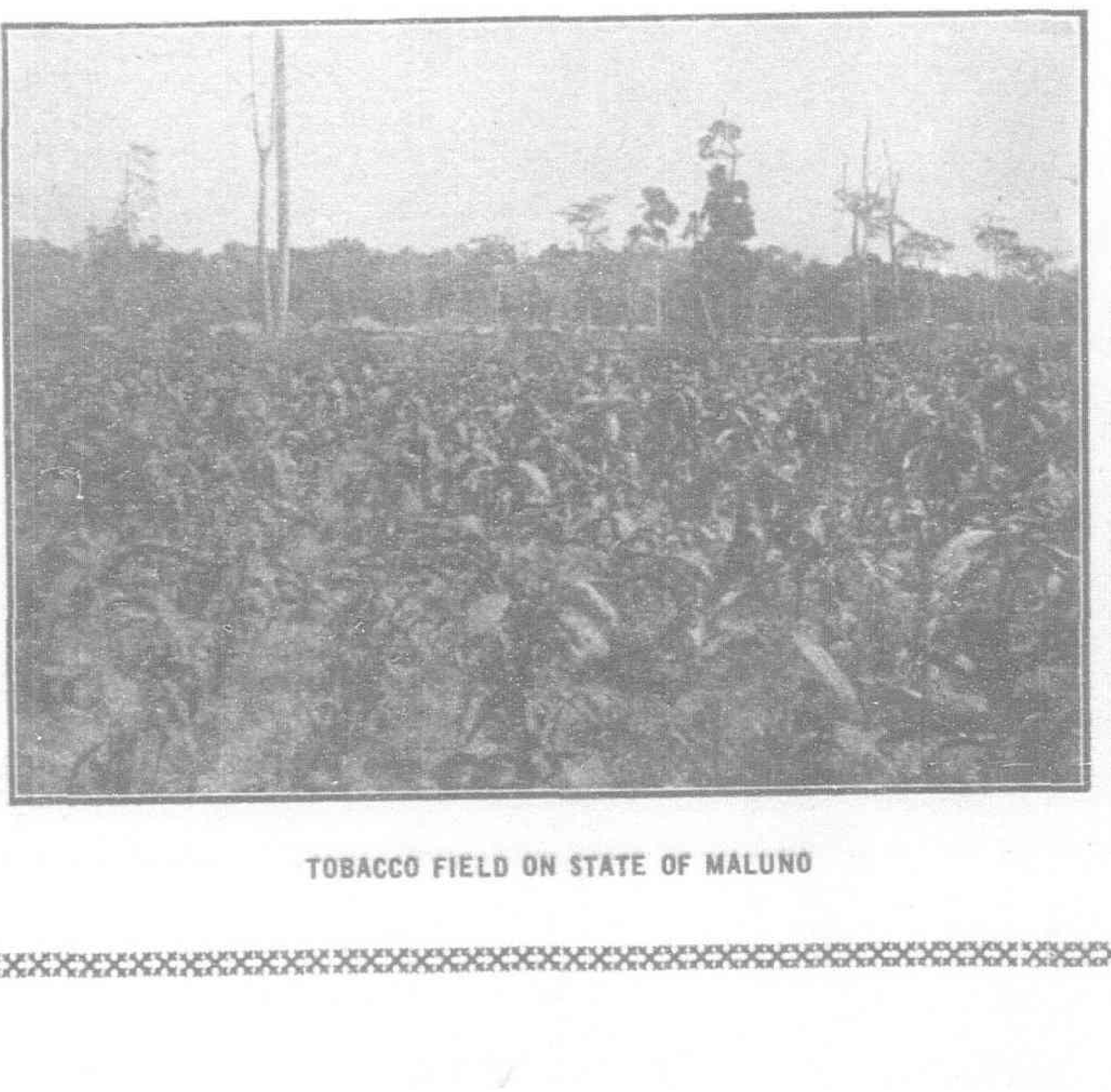
Messrs. Baer Senior & Co's Successors,
Prop. "La Yebana" Cigar Factory,
Manila, P. I.

Gentlemen:-

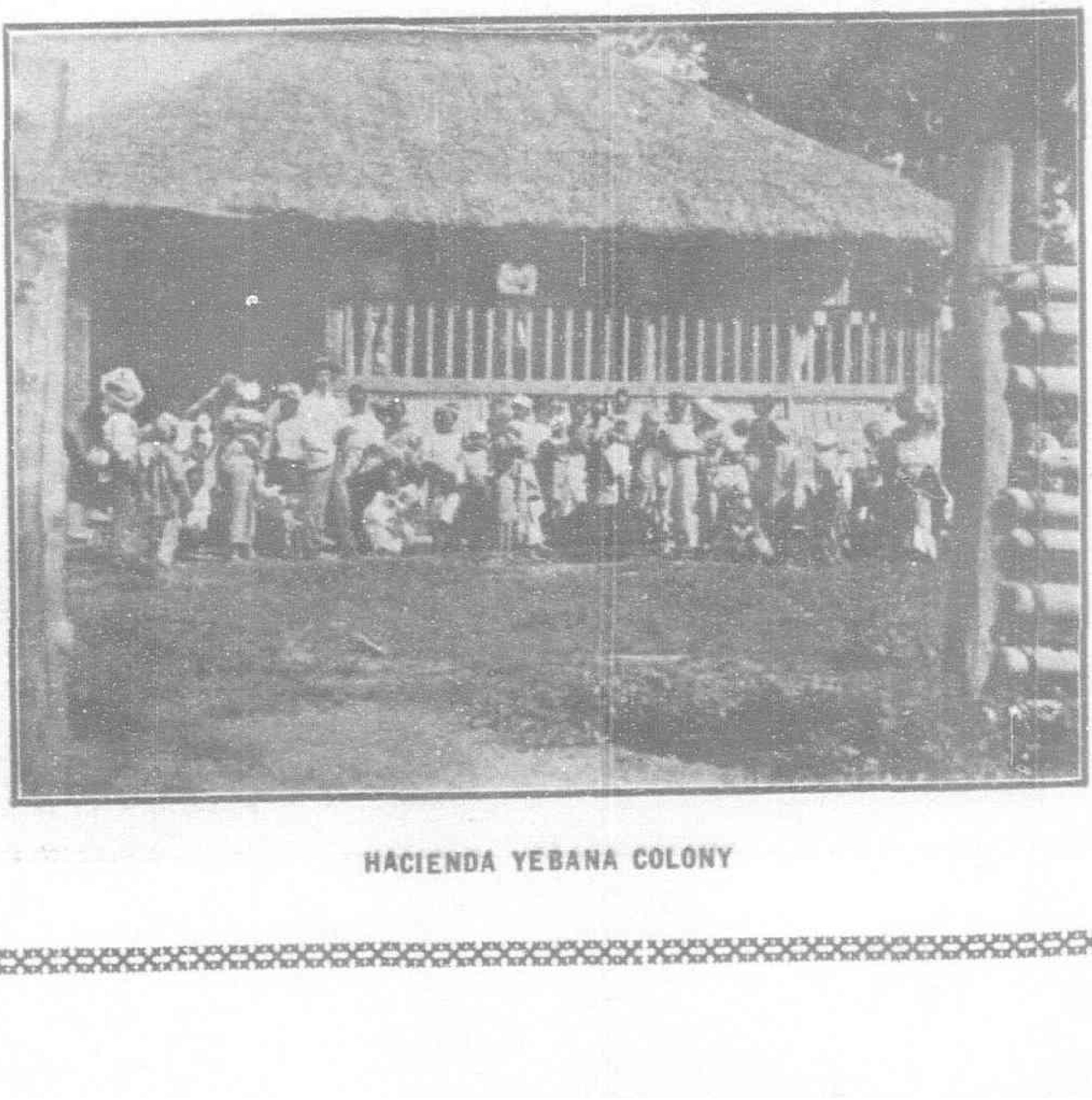
In answer to your letter of recent date, I have the honor to inform you that the two gold medals awarded the "La Yebana" Cigar Factory for the best manufactured cigars, and the best quality of cigars were given your factory after a careful and complete examination by the International Jury of Awards of this Exposition, and that your cigars were judged together with all other cigar exhibits on the grounds, including Havana and Domestic cigars.

Yours truly, Henry E. Dosch

Director of Exhibits and Member
of International Jury of Awards
Lewis & Clark Exposition.



TOBACCO FIELD ON STATE OF MALUNO



HACIENDA YEBANA COLONY